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IBS Intelligent
Battery
System 
the ultimate Battery System



DBM20A
DBM20AS
Solar

**In-Car Charger 20A
with DC/DC-Converter**
(New option Li-board battery)
Manual

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Language / Sprache / Langue / Lingua

For manual in another language follow the path or scan QR-Code.

Für Handbücher in einer anderen Sprache, Links folgen oder QR-Code scannen.

Pour les manuels dans une autre langue suivez le link ou scannez le code QR.

Per il manuale in una otra lingua seguite il link o scannerizzate il codice QR.

English



Deutsch



Français



Italiano

Uscita
prossimamente

<http://www.ibs-tech.ch/download/manuals-ibs.html>

Product Description

The IBS-DBM20A 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 DBM20A 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 IBS modules which can be combined with the DBM20A to get special functionality or extra performance.

Before installing the DBM20A identify which alternator type is in use and which charge level the Aux battery requires.

This model DBM20A enables the adaptation of the measurement, monitoring, control and regulation functions for Li on-board batteries (LiFePO₄ with nominal voltage of approx. 12.8V). Please refer to chapter Configuration during commissioning.

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.

DBM20A V2.9 software for smart alternators of Euro 6d-Temp vehicles

In the past, the alternator charged the starter battery as soon as the engine was running. Classic dual battery systems such as the IBS-DBS or IBS-DBR, also known as VSR, Voltage Sensing Relay, charge the auxiliary battery easily and reliably during this time.

Voltage-reducing alternators have been installed for several years, which charge normally when the vehicle is started and reduce the charging voltage to around 13.3V over the travel time. Among other things, this prevents the battery from being fully charged after a short time. When charging heavily discharged auxiliary battery, this can lead to them no longer being fully charged. In some vehicles, an ATO-Type diode can be installed in series to the alternator fuse, which increases the charging voltage by 0.6V in classic battery systems and guarantees a fully charged starter and auxiliary battery again.

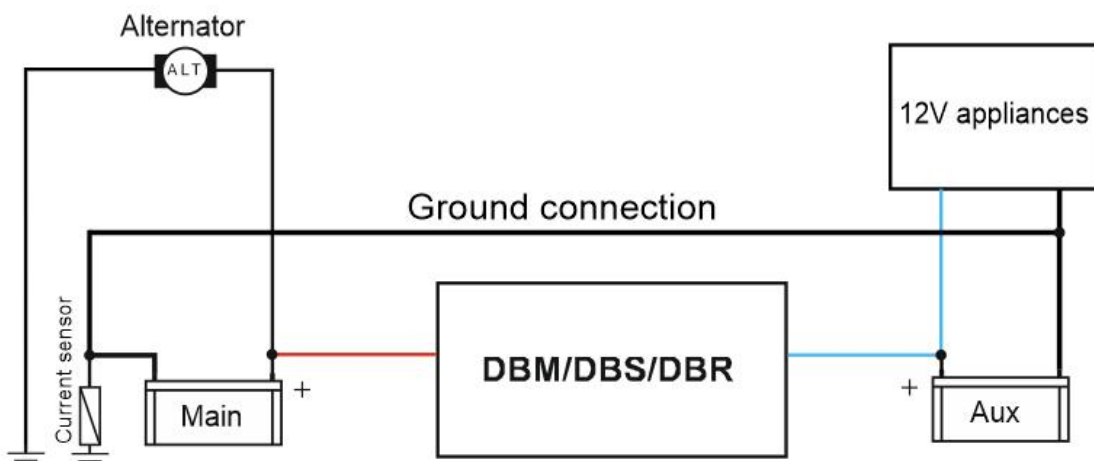
In recent years with various exhaust gas scandals, the vehicle industry has started to use smart alternators, which only charge when no load is on the engine (downhill, gear change, braking and sometimes shortly after the vehicle starts) and thus allegedly reduce exhaust emissions. A DC/DC charging booster is used here, which continuously ensures a good constant charge on the auxiliary battery.

The new IBS-DBM20A with software V2.9 and additionally installed LinkStartKit or IBS-DBS dual battery system activates the dynamic Smart Alternator detection. The measurement of various latest vehicles has shown that some smart alternators can switch between classic, voltage-reduced and smart alternator charging. The IBS system monitors the alternator and changes from classic to smart charging and shortens the charging time if possible. A DC/DC charging booster can only charge up to its maximum charging capacity. The IBS-DBM20A with installed relay charges with the relay while the alternator fully charges, whereby the full charging capacity of the alternator brings the auxiliary battery to approx. 80% charge in a short time. The charging booster with the 3 to 4 charging stages (bulk, absorption, equalize, float) finishes the charge. On long journeys, the DBM20A changes to float charge mode at the end of charging to avoid an overcharging of the auxiliary battery.

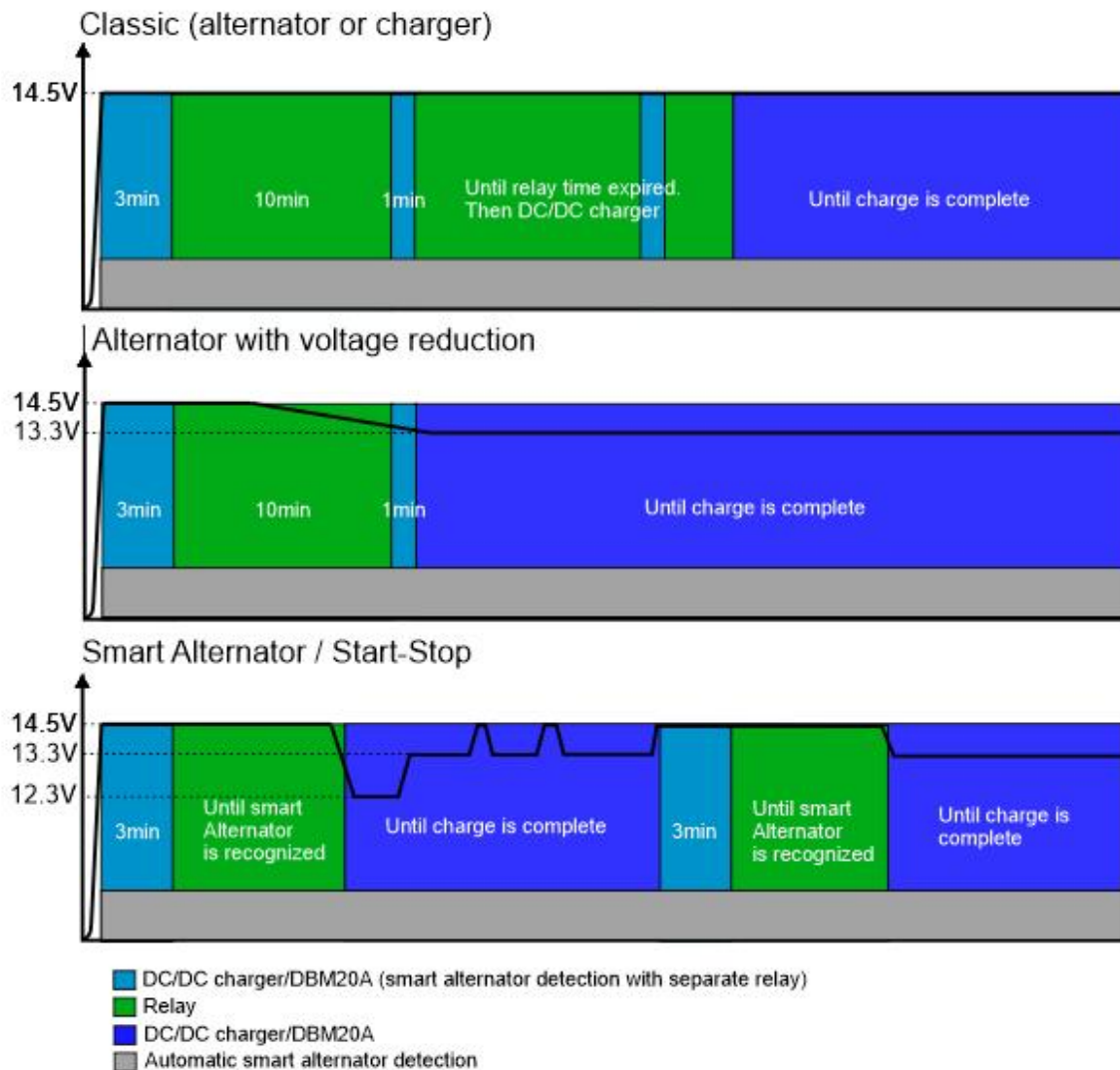
In combination with lithium batteries, the DBM20A limits the start current to approx. 0.2C

Vehicles with a current sensor to ground

For vehicles with a current sensor to earth, the -Pole connection of the auxiliary battery (Aux) must be connected directly to the -Pole of the starter battery (Main) and not to the chassis of the vehicle. All additionally installed consumers must be connected directly to the +/- pole of the additional battery connected. For individual vehicle brands, the presence of the additional battery can be activated in the system settings.



Alternator types



Important settings

In order for the smart alternator detection to work reliably, the IGN connection (light blue) must be connected to the ignition or Terminal 15. This connection can be left open on vehicles with a classic alternator.

With the battery size selection (new programming step 2, selection: small (<80Ah), mid (80-150Ah), large (> 150Ah)), the system knows how big the additional battery is and optimizes the relay time accordingly.

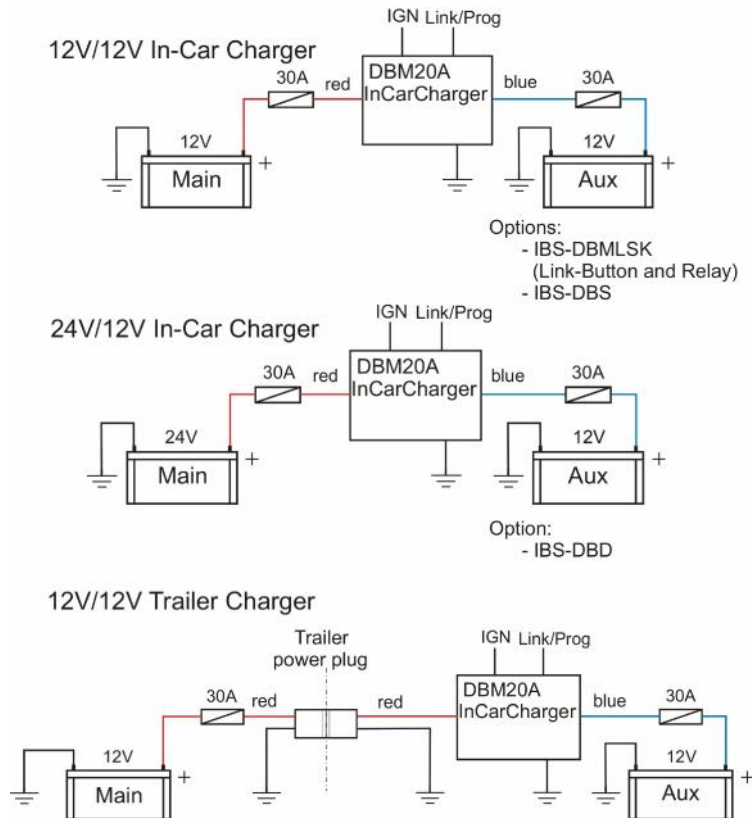
Li-ion auxiliary batteries are increasingly being used. Here it is important to correctly configure the DBM20A for lithium (new programming step 1) so that all switching points and control parameters are adjusted and the equalize mode is deactivated.

If an IBS-DBS is also installed on the DBM20A, it is very important that the correct programming of the DIP switch settings (see page 8 in the IBS-DBS manual) is carried out, especially the lithium and DBM20A configuration.

With DBM20A installations without LinkStartKit or IBS-DBS, older versions can also be used in vehicles with Smart Alternator.

Applications

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



Technical Informations

The DBM20A 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**

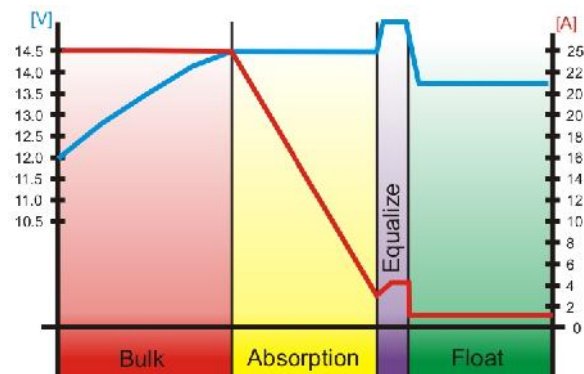
As soon as the chosen voltage is reached on the battery, the next step starts. While the absorption the most energy is charged into the battery. Here the charging current gets lower and lower while keeping the voltage constantly on chosen level.

3. Step: **Optional Equalize**


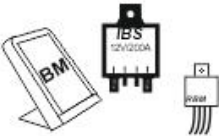
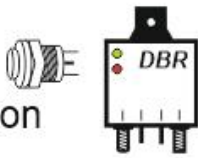
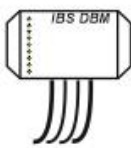
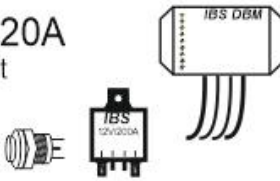
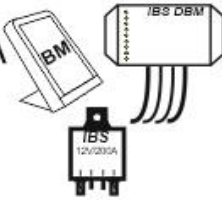
After current drops under 3 amps the optional equalize starts (only when configured and only once in a month at most). In this step the charger boosts the voltage for an additional 0.6V on the battery for a certain period. This forces the sulphation to be reversed which helps the battery to last longer 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 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.



Combinations of IBS Devices

- | | | |
|--|---|---|
| <p>① IBS-DBS
(DBi-DBS)</p> |  | <p>Dual battery bi-directional
200A/500A Link start
Battery status, charge, alarms
30/120 minutes manual Link (recovery winch support)</p> |
| <p>② IBS-DBS
(DBi-DBS)
+RBM+</p> |  | <p>Dual battery bi-directional
200A/500A Link start with defective Main battery
Battery status, charge, alarms
30/120 minutes manual Link (recovery winch support)</p> |
| <p>③ IBS-DBR
with Link-button</p> |  | <p>Dual battery bi-directional
200A/500A Link start with defective Main battery
System Status
30 minutes manual Link
RBM is integrated</p> |
| <p>④ IBS-DBM20A</p> |  | <p>In-Car Charger 20A(DC/DC-converter) 3-4 stage charger
Dual battery uni-directional
Battery status, charge mode, system status
12V/12V-DC/DC 3-4 stage charger
24V/12V-DC/DC 3-4 stage charger
Trailer battery 3-4 stage charger</p> |
| <p>⑤ IBS-DBM20A
+ LinkStart-Kit</p> |  | <p>In-Car Charger 20A(DC/DC-converter) 3-4 stage charger
Dual battery bi-directional
Fast Charge up to 200A
12V/12V-DC/DC 3-4 stage charger
200A/500A Link start with defective Main battery
dynamic Link (recovery winch support)
30/120 minutes manual Link
RBM integrated</p> |
| <p>⑥ IBS-DBM20A
+ IBS-DBS</p> |  | <p>In-Car Charger 20A(DC/DC-converter) 3-4 stage charger
Dual battery bi-directional
Battery status, charge mode, system status
12V/12V-DC/DC 3-4 stage charger
Fast Charge up to 200A
200A/500A Link start with defective Main battery
dynamic Link (recovery winch support)
30/120 minutes manual Link with DBS Software 8.1
RBM integrated</p> |

Programming the system

Procedure

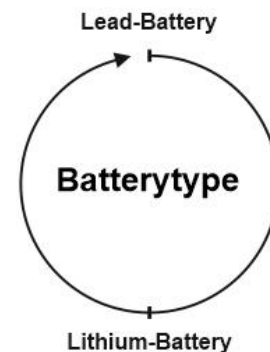
1. Showing software version (automatically).
2. Battery type configuration (manually)
3. Battery capacity configuration (manually)
4. Configuration of charge level (manually)*.
5. Saving the selection (automatically).
6. Check for relay (automatically).
7. Indication if relay was found or not (automatically).
8. 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 DBM20A has switched to Stand-By mode (DBM Status LED is flashing green).

The System automatically starts up when the black (GND) and the red (+Main) wires are connected and first shows its software version. After that all the LED's are flashing for 30s, in this time it can be switched in the configuration mode when the yellow (**Prog/Link**) wire is briefly contacted to GND. If no change is made in one of the three configuration steps, the system automatically switches to the next configuration step after 15 seconds with the corresponding LED flashes quickly. After a change, the system changes to the next configuration step after only 5 seconds of inactivity. If the configuration mode is not started, the DBM20A starts with a fast flashing pattern, in the default mode (Low Level/Lead-Battery/80-150Ah) or the last saved configuration. The following settings can be made in the configuration mode.

Configuration Li-board battery (LiFePO4,)

If the Main Battery LED lights up green, the DBM is in the battery type configuration. With a short ground contact of the Link/Prog wire, you can switch back and forth between lead and Li batteries. If the DBM status LED flashes green and red, the DBM is in the Li-battery configuration. If the LED only flashes green, the DBM is configured for lead batteries (default). The 2 types of batteries repeat in a cycle.

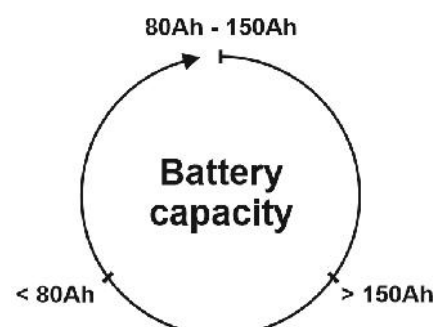


Status LED	Battery type
	Lead-battery
	Lithium-battery

Configuration Battery capacity

If the Charge Status LED is green, the DBM is in the battery capacity configuration. With a short ground contact of the Link/Prog wire, you can switch between the three different sizes. The 3 capacities repeat in a cycle.

High Level	Batteries > 150Ah
Medium Level	Batteries 80-150Ah
Low Level	Batteries < 80Ah

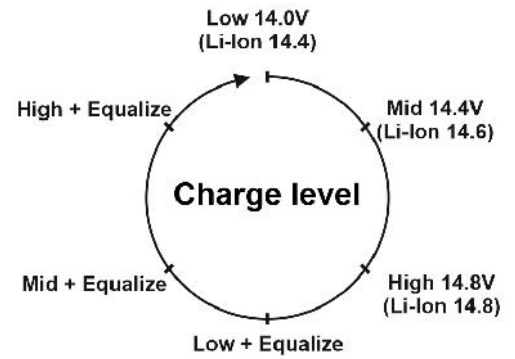


Configuration charge setting

When the DBM is in the charging setting, the relay LED lights up green. Six different charging modes can be set in this configuration step. If a short ground contact is made with the Link / Prog line, the system switches to the next charge level. The 6 selection levels repeat in a cycle.

Charge Select Indication

Low Level	Charge level Low (14.0V)
Medium Level	Charge level Medium (14.4V)
High Level	Charge level High (14.8V)
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. **For Li-board battery the Equalize mode must not be activated.**

Selection of charge level

The default setting is Low at 14.0V without Equalize. Before choosing the charge level please consider the specifications supplied by the battery manufacturer. The Equalize Mode (if activated) reformats 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:

Low	GEL / LiFePO4
Medium	AGM / LiFePO4
High	Spiral Cell / AGM / Pb liquid / Calcium

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 IBS-DBS by pushing the link Button on the monitor [with IBS-DBS make sure to push auto Button when the DBM20A 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 DBM20A 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

Automatic relay detection

- Engine off and wait 2 minutes
- Switch on ignition, switch on headlights and fan, wait 1 minute
- Press the link button (button or monitor), click from the relay audible when it is recognized.

Mounting

Mount the DBM20A 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. The DBM20A will typically warm to around 40°C depending on application.

If the DBM20A 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 DBM20A 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	Without options	9
12V / 12V System	With Link Start Kit	10
12V / 12V System	With IBS-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 as well 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!

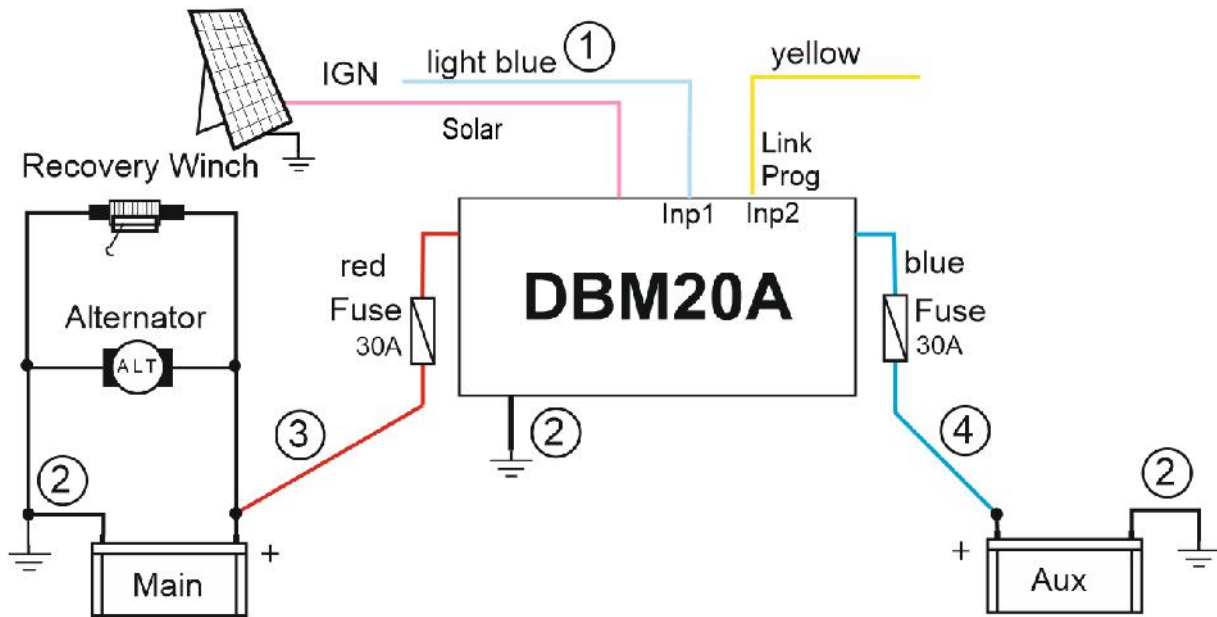
After installation

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>).



12V/12V-System without options

For a better understanding of how the system is programmed first read the Programming the system steps on page 8. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 11 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 DBM20A 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), DBM20A 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 8 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
4. Connect the blue wire (+aux) **last**.

New parallel operation 2 DBM20A

Two DBM20A can be operated in parallel, resulting in a maximum charging current of up to 45A. This new function is only supported if no relay is installed in the system (no link start kit or no IBS-DBS dual battery system with relay). Depending on the load behaviour, both systems work with full power, with partial load or low power, a DBM20A, a "loading error" status display, can be deactivated. When more charging power is required again, the deactivated DBM20A reactivates automatically again.

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 with Link Start Kit

Extra functions with Link Start Kit IBS-DBMLSK

1 Link Start:

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

2 Automatic Winch support*:

the DBM20A 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:

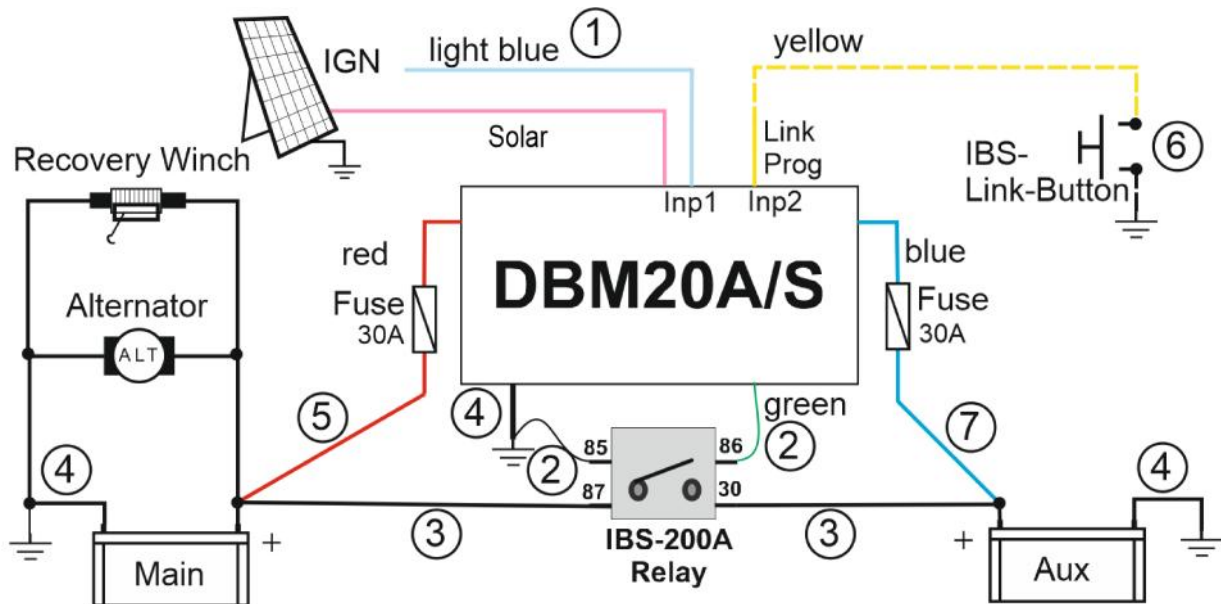
When the car is started the alternator first charges both Main and Aux battery (Fast Charge) and then the DBM20A switches to DC/DC Charge to get a 100% full Charge as configured.

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 8. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 11 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 DBM20A 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), DBM20A 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 8 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
 6. With an IBS-DBMLSK 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)!

12V/12V-System with IBS-DBS and Relay

Extra functions and applications with IBS-DBS

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

DBS software version 8.1

This version is fully DBM20A compatible.

1 Link Start:

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

2 Automatic Winch Support*:

The DBM20A 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 DBM20A 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 DBM20A compatible.

Extra functions **1 Link start**, **2 automatic Winch support**, **4 solar charge**, **5 Fast Charge**, as well 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).

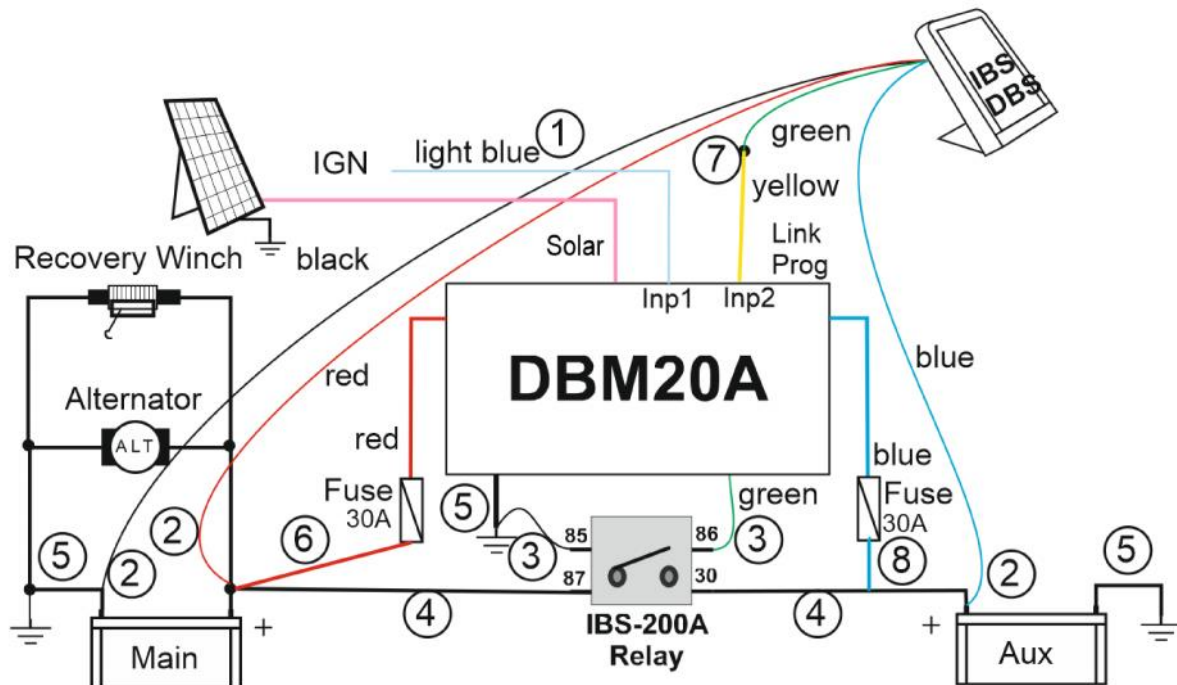
Now **start** the engine.

For resetting respectively to get back to normal functionality of the DBM20A 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 DBM20A.

For a better understanding of how the system is programmed first read the Programming the system steps on page 8. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 11 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 DBM20A 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), DBM20A 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 IBS-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 8 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 DBM20A.
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?**

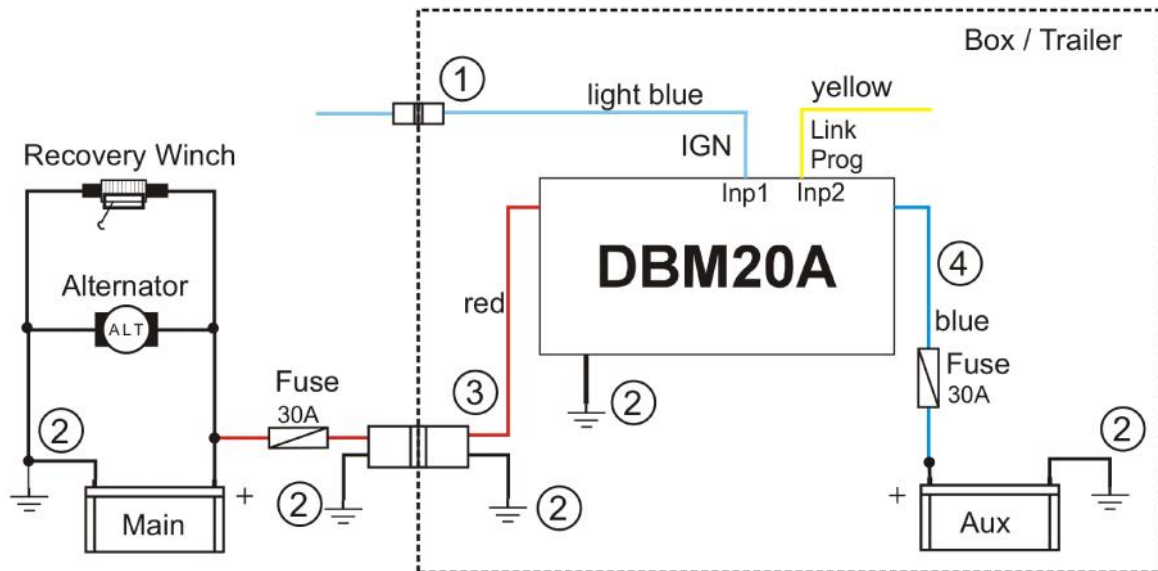
Notice

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 8. Otherwise the system may need to be reinstalled.

Read the notes for the mounting and wiring extension on page 11 before starting the installation.



Please read Instructions carefully prior to installation.

Choice of light blue connection IGN:

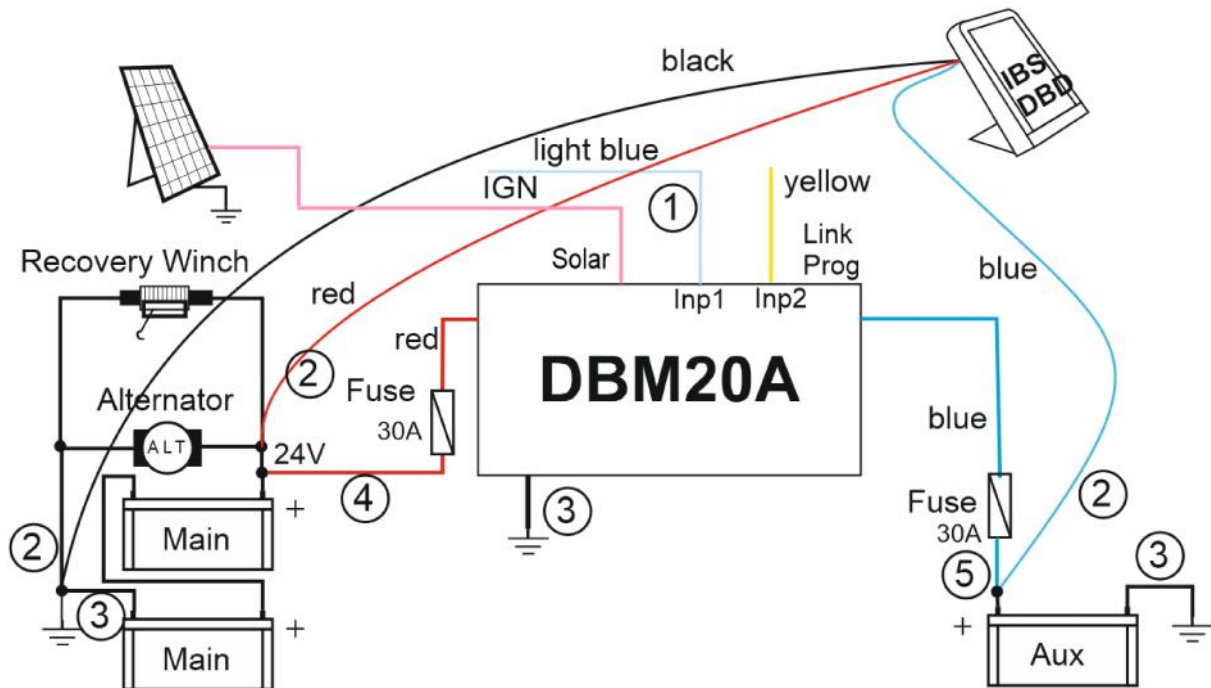
- With alternators (smart alternators) that cut off charge temporarily, connect IGN wire to Car Ignition (Terminal 15). When the alternator turns off, the DBM20A keeps charging until the Main voltage drops below 11.9V or the alternator kicks in again.
 - With all other alternators do not connect the light blue (IGN), DBM20A 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) as well with a plug (Brad Harrison) (**ATTENTION**: system is starting up -> refer to page 8 **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 8. Otherwise the system may need to be reinstalled.
Read the notes for the mounting and wiring extension on page 11 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 DBM20A 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), DBM20A 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 8 Programming the system**). (**Continue installation only after System has switched to Stand-By mode**)
5. Connect the blue wire (+aux) **last**.

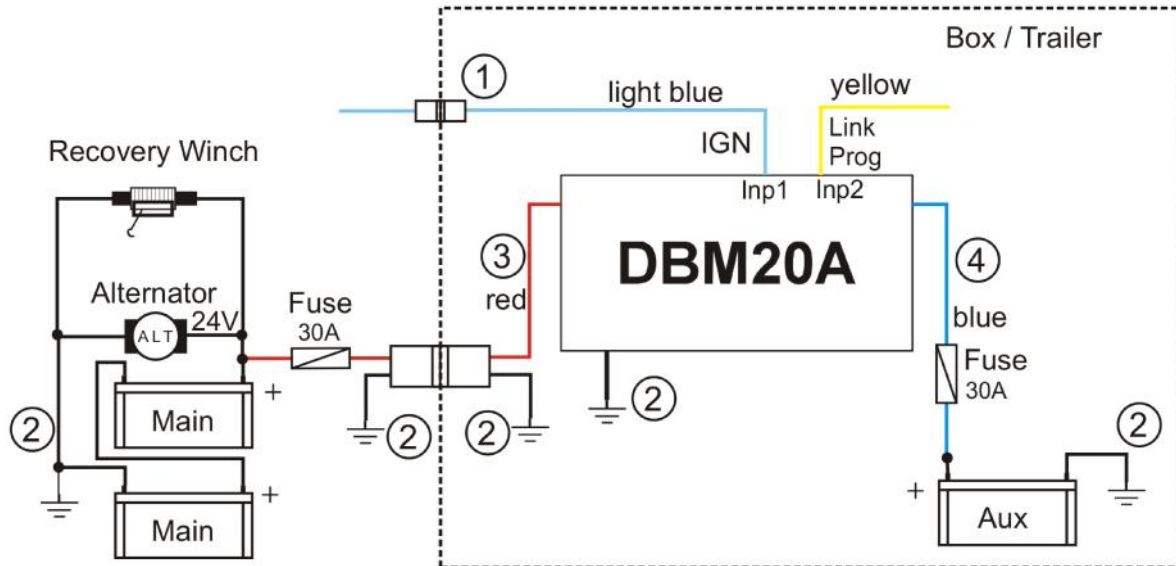
Notice

- **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 8. Otherwise the system may need to be reinstalled.

Read the notes for the mounting and wiring extension on page 11 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 DBM20A 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), DBM20A 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 DBM20A

To achieve a higher charge current in a 24V/12V system it is possible to operate up to three DBM20A in parallel. This allows a charge current up to 60A.

ATTENTION: Parallel operation of DBM20A is **only** possible in **24V/12V** systems!

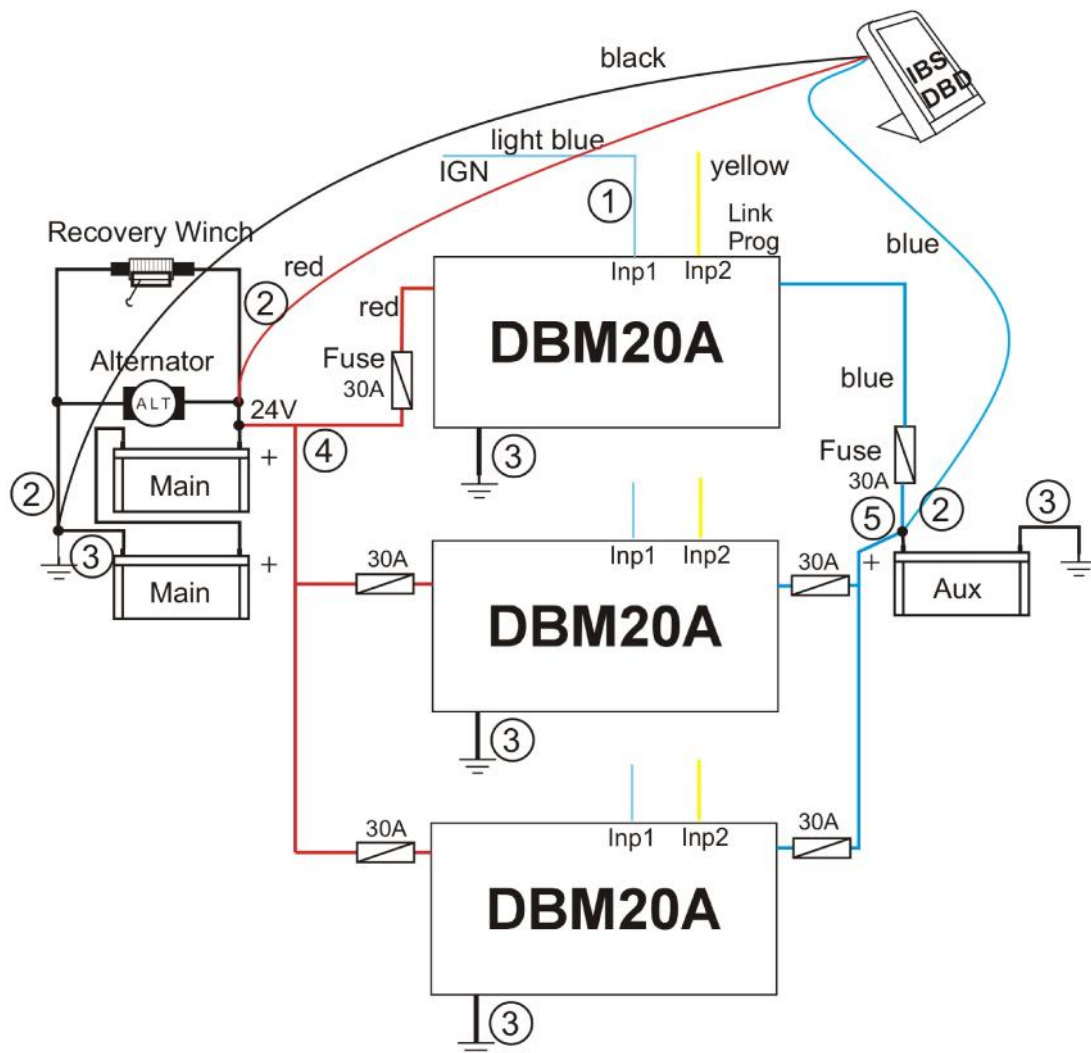
Never install more than three DBM20A for parallel operation!*

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 DBM20A 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.

- IBS tested up to three Devices in parallel operation

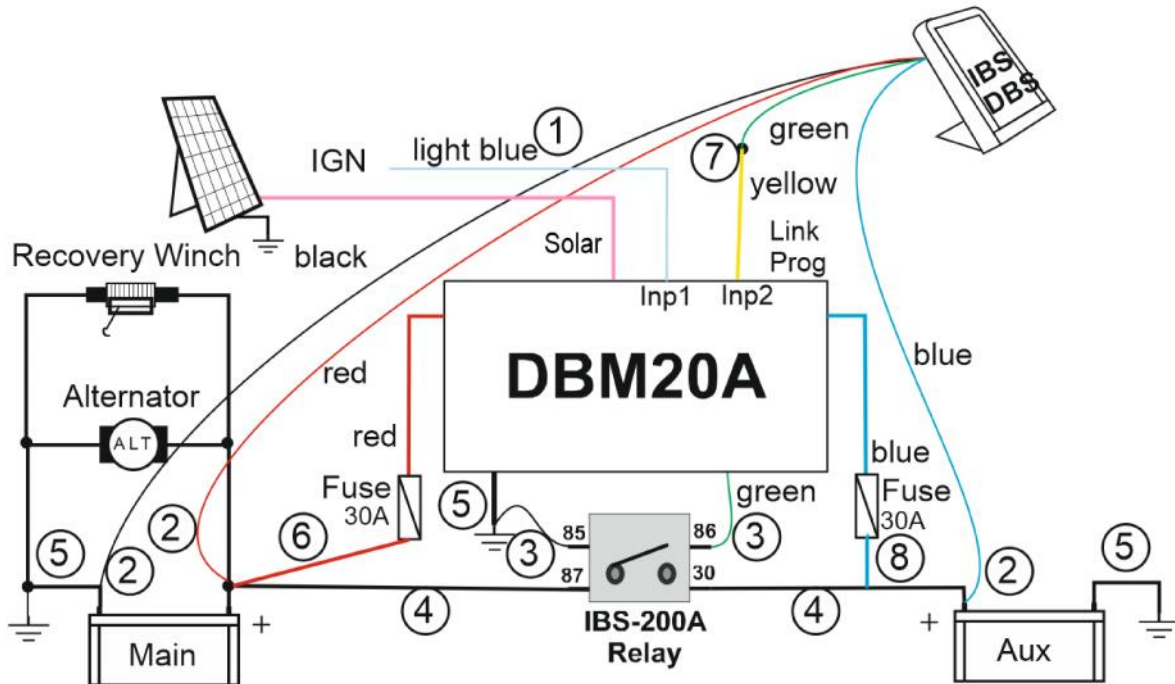
Solar

The DBM20AS has a solar input (pink cable) that supports up to 12A charging current. This enables the connection of up to 250W panel power.

The solar controller only supports 12V Solar panels. Domestic 24V and 2 times 12V solar panels in series must not be connected

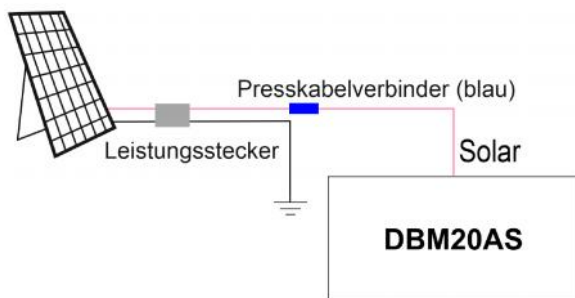
When a solar panel is recognized by the system, the Equalize LED flashes green.

When Equalize mode is active, it is only displayed every 20 seconds in standby mode. At this point, Solar cannot be displayed.



Installation with solar connection kit DBM20AS-SCK

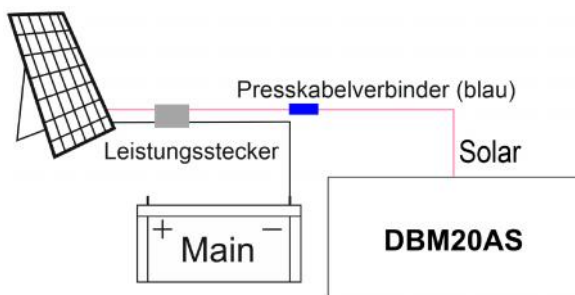
Standard installation



The two pink cables are connected to the blue compression cable connector.

In vehicles without a current sensor, the black cable can be connected to any earth point.

Installation on vehicles with a current sensor



For vehicles with a current sensor, the black cable must be connected to the negative pole of the battery.

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 DBM20A 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** (DBMLSX) or **Link Button** (IBS-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** (DBMLSX) or **Link Button** (IBS-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 DBM20A it is always necessary to have both a starter and an auxiliary battery connected to the DBM20A. A power supply may be used to mimic the alternator. Carry out the test procedure according to page 13. Set the laboratory supply to 14V / 30A. If there is an infeed, the DBM20A / S switches from stand-by to charging status. Depending on the current charging mode, the charging current of 18A-23A can be measured with a clamp meter.

Display overview

DBM Status LED

Pattern	Meaning
	Operating (DC/DC or relay)
	StandBy
	StandBy Lithium





Charge Select LED's

High Level	Charge level High (14.8V)
Medium Level	Charge level Medium (14.4V)
Low Level	Charge level Low (14.0V)
Equalize	Equalize Mode: Low/Mid/High +0.6V for limited time Not selectable with lithium battery

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
	StdBy  green flashing Active  green on	DC/DC converter charges / Stand-by
1	    ...	Over temperature >100°C / Main- or Aux battery low / Li-battery - mode at initialization
2	     ...	Link error (Relay error) Error occurs the latest after 5 minutes when relay is defective or removed. The DBM20A 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 (LSK) 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	     ...	Over current error in the solar controller
6	Flashing Main or Aux Battery  / 	Missing battery (Main or Aux battery)
7	  ...	Start-up error
8	    ...	Over current
9	     ...	Internal error
10	      ...	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 IBS-DBS (up to Software 8.0)

The combination of the DBM20A with a IBS-DBS and IBS-Relay can lead to an over voltage alarm*. Because of higher charge voltage of the DBM20A compared to alternator charge voltage it is also possible to have a Link failure alarm* with IBS-DBS due to the difference between the Main and the Aux battery voltages of more than 0,5V.

* These alarm is indicated on IBS-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)		
Auto de-link voltage standard / Li-Battery	12.7V / 13.0V (Li-Battery)		
Aux battery status indicator full (green LED)	>13.0V / 13.7V (Li-Battery)		
Aux battery status indicator half full (yellow LED)	13.0V / 13.7V (Li-Batt.) > <11.8V / 12.2V (Li-Batt.)		
Aux battery status indicator blank (red LED)	<11.8V / 12.2V (Li-Battery)		
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 12V/12V nom/max	20/23A		
Charge current 24V/12V nom/max	16/18A		
Solarpower max	250W (12V Panel)		
Solar charge current	12A		
V _{oc}	21V		
Max solar voltage	80V		
Waterproofing	Silicon		
PCB Quality	IPC3 RoHS (military standard)		
Efficiency	Typically 95 %		
Standby Current	< 10 mA		
Dimensions	140 x 82 x 46 mm		
Weight DBM20A	0.6 kg		
Weight packed	1.0 kg		
Operable Temperature Range	-25°C - + 85°C		
Warranty	2 years		
Power wiring width (rd,bk,bl)	4mm ²		
EMC	CISPER 25 (Automotiv)		

Accessories

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

IBS-DBS



IBS-DBD 24V/12V
IBS-DBD 12V/12V



IBS-DBMLSK



DBM20AS-SCK



Personal Data

My Car: _____

Aux battery type: _____

My configuration: _____

Performance solar cell: _____

Installation Date: _____

Notes

Included

- IBS-DBM20A System
- IBS-DBM20A Manual
- IBS-DBM20A Terminal kit (2 pieces of fuse holders and 30A fuses included)

IBS-DBM20A/S Manual date 25.01.2021

Manual version 2.9.6

Software version 2.9.6



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