



**Operating and installation guide
digital control device *m.unit blue***

***valid from serial no. 000xxxxx
(see the serial sticker at the device)***

Suchen Sie die deutsche Bedienungsanleitung?

<http://motogadget.com/de/elektrik/elektronische-steuerbox-m-unit/downloads.html>

Thank you very much for purchasing a high quality product by *motogadget*.

Please read the following information and recommendations thoroughly and follow these instructions during installation and use of the instrument. No liability is assumed by *motogadget* for damage or defects resulting from negligence or failure to follow the operating and installation guide.

CAUTION !

THIS PRODUCT OPERATES ON STRONG CURRENTS. CONNECTION FAILURE MAY LEAD TO CABLE FIRE OR EXPLOSION OF VEHICLE'S BATTERY. THERE IS A RISK OF SERIOUS OR LETHAL INJURIES.

IF YOU ARE NOT A CERTIFIED MOTORCYCLE TECHNICIAN PLEASE STOP HERE AND ASK YOUR LOCAL MOTORCYCLE SHOP FOR PROFESSIONAL INSTALLATION!

SEMICONDUCTOR SWITCHES IN USE! MEASURED VOLTAGES AT TERMINALS ARE NOT SUITABLE TO DIAGNOSE A FAILURE OR DEFECT.

MOUNTING ON UNEVEN FACES WILL CRACK THE HOUSING AND CAUSE A FAILURE.

Please read the instructions below thoroughly and follow their advice when handling your device. Warranty or liability claims to *motogadget* for damages resulting from non-compliance with this manual will be null and void.

Find more product informations:

<http://motogadget.com/en/electrics/electronic-control-box-m-unit/downloads.html>

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1 Review Of Delivery

All products from *motogadget* are thoroughly checked to ensure they are completely fault free when dispatched. Please check the received goods immediately for possible transport damage. If you find any damage or other deficiencies, please contact us immediately.

In this regard we refer to our general terms of business and delivery, which are published under www.motogadget.com. Should a return of the received delivery be agreed, please note that we only take back goods in their original packaging. The instrument and its accessories must be returned within the legal period of time and without any traces of use. We do not assume any liability for returns which are insufficiently insured or packed.

2 Exclusion Of Liability

THE M-UNIT OPERATES STRONG CURRENTS. CONNECTION FAILURE MAY LEAD TO CABLE FIRE OR EXPLOSION OF VEHICLES BATTERY. THERE IS A RISK OF HEAVY OR LETHAL INJURIES. THE DEVICE AND ITS ACCESSORIES MUST BE INSTALLED BY A CERTIFIED MOTORCYCLE TECHNICIAN AND IN AN AUTHORIZED SERVICE CENTER.

IN CASE OF REVERSE POLARITY OR VOLTAGE ABOVE 24V M-UNIT CAN BE DAMAGED. THE DEVICE HAS TO BE REPLACED AND ALL WARRANTY CLAIMS BECOME INVALID.

DEVICE HOUSINGS AND ALL OTHER DELIVERED PARTS MUST NOT BE OPENED OR DISMANTLED. IN CASE OF NON-COMPLIANCE ALL WARRANTY CLAIMS BECOME INVALID. THE USE OF THE DELIVERED DEVICE AND ITS ACCESSORIES FOR RACING OR OTHER COMPETITIONS, AS WELL AS ALL USES THAT DO NOT CORRESPOND TO THE RECOMMENDED APPLICATION RENDER ALL WARRANTY CLAIMS INVALID.

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3 Safety Instructions

- **PRIOR ELECTRICAL CONNECTION OF THE DEVICE AND GENERALLY PRIOR TO ANY WORK AT THE VEHICLES ELECTRICAL SYSTEM BATTERY MUST BE DISCONNECTED COMPLETELY. THEREFORE KEEP THIS ORDER: DISCONNECT AT FIRST THE NEGATIVE TERMINAL AND THEN THE POSITIVE TERMINAL. FOR THE RECONNECTION ACT IN THE REVERSE ORDER. USE OF M-UNIT TO VEHICLES WITH PLUS POLE TO VEHICLE FRAME (OLDER ENGLISH MOTORCYCLES) IS NOT POSSIBLE.**
- **INSTALLATION AND ELECTRICAL CONNECTION OF THE M-UNIT HAS TO BE CARRIED OUT BY A CERTIFIED MOTORCYCLE TECHNICIAN ONLY.**
- **ALL CABLE DIAMETERS MUST BE DIMENSIONED ACCORDING THE CURRENT FLOW. THE CABLE DIAMETERS MUST NOT GO BELOW THE VALUES LISTED IN CHAPTER 8.5. CURRENT FLOW OF CONNECTED LOADS MUST NOT EXCEED THE VALUES LISTED IN CHAPTER 8.5**
- **THE CABLE ENDS TO M-UNIT'S CONNECTION TERMINAL MUST BE CRIMPED WITH CABLE END SLEEVES. THEREFORE USE A SUITABLE CRIMPING TOOL.**
- **ALL ELECTRICAL CONNECTIONS IN THE WIRING LOOM AND AT THE CONNECTION TERMINALS HAVE TO BE CARRIED OUT IN A PROPER WAY. FAILURES AT CONNECTING JOINTS MAY CAUSE A CONTACT RESISTANCE AND MAY LEAD TO HEAT GENERATION DURING HIGH CURRENT FLOW. THERE IS A RISK OF SERIOUS OR LETHAL INJURIES.**

6 Functions And Operation

The m-Unit is able to act as central control unit in the vehicle's electrical system. It provides following features:

Without smart phone:

- Complete digital push button control unit; optional 4 or 5 push button operation
- complete replacement of all OEM fuses 10 independent circuits are digitally supervised; a circuit will be shut down in case of interferences after removing the interference, the safety feature will be reset automatically
- integrated, digital, load-independent flasher relay; with programmable switch-off feature (optional), selectable m-Wave mode
- turn signal setting for use as position light
- parking light, headlight flasher
- integrated digital brake-light modulator with programmable flashing sequence, acceleration-controlled emergency brake-light
- pairing of m-unit with other motogadget products via LIN bus
- integrated starter relay for solenoid switch (up to 30A switching capacity)
- smart and fully configurable load control / shut-off for maximum starting power of battery on starting process
- low beam and high beam control (up to 200W switching power) using just one push button
- integrated digital horn relay
- integrated position-independent alarm system
- integrated hazard light feature
- diagnostic feature for layout of input, output, circuit switching status, diagnosis of short-circuits etc.
- two fully configurable auxiliary outputs AUX1 and AUX2

Pairing of m-unit with your smart phone via Bluetooth in combination with our „m.garage“ app providing advanced functionality:

- Pairing via Bluetooth LE (Low Energy); therefore extremely low power consumption of vehicle and smart phone cell
- reporting of alarm events (date, time, vehicle „down“ etc.) to smart phone
- real-time analysis of all inputs / outputs, measurements of currents, voltage, temperature
- manual switching of outputs using m.ride app (except starter)
- firmware updates from any location
- configuration of setup menu using m.ride app
- Keyless Go feature using encrypted and secure pairing with your smart phone
- speedometer input is compatible with all standard vehicle speedometer inputs and automatically calibrates via smart phone GPS
- the m.unit's speedometer input for storage and matching of vehicle's odometer enables for vehicle management with an overview of maintenance tasks and states of wheels, chain, brake pads, oils, operating supplies, spark plugs etc.
- logging of states, alarms and maintenance
- fully automatic driver's logbook
- display of parking position and „ping“ feature for locating your vehicle
- calibration and accurate current measurement enable detection of defective LED turn signals and all standard illuminants

The m.unit is made of a newly designed high-performance thermosetting plastic and resistant to moisture, heat, cold and vibrations. Microprocessor operated and supervised circuits guarantee highest reliability. Current flow of each circuit is measured with high accuracy. In case of failure like a short-circuit the concerning loop will be shut down in a split second. All switching activities are carried out by state of the art semiconductor switches in a fast, wear-free and almost lossless way.

Therefore no other devices, relays, boxes or units as part of the wiring harness are necessary. A complete new and minimised vehicle wiring can be made with minimal time, materials and effort; compared to conventional solutions, only a fraction of space and cables is needed. State of the art technology like pulse width modulation afford new possibilities like connecting rear and brake light together with only one cable. When using m.button, the number of handlebar instruments connections will be reduced to a single cable by use of our interference-free, proprietary data bus.

The current status of each circuit is shown by an internal LED at the m-unit's topside :

LED off	- input not active, output not powered
LED on	- input active, output powered – normal condition
short flashing	- output shut-down due to short-circuit or overload

Turn Signals

Automatic shut-off can be adjust in setup menu. If this feature is activated a countdown will start once the signal is flashing. If the adjusted countdown has ended the turn signal stop flashing. The countdown will stop and set back if the brake is activated. Once the brake is released the countdown start again with full time length. If a turn signal switch is used and signals has been automatically shutting down, the switch has to set back to centre prior set the turn signal switch again to left or right. If two turn signal push button are used is additionally the lane change mode available. If the button is pressed very shortly the signals will flash only 3 times.

Hazard light

For starting the hazard light hold the push buttons for left and right turn signal for 2 seconds. If a turn light switch is used, the hazard light function can only be activated if a additional hazard light switch is activating both turn light inputs at the same time. The hazard light mode will stay active even if the main (ignition) switch is deactivated.

Light control

In order to save the vehicles battery power the head light is switched off after key lock is switched on. The head light will be activated automatically after pressing the start button. Further light control modes can be selected under setup menu no. 8.

If a push button is used for high/low beam control, a short push will toggle between high and low beam. Holding the button for 2s will switch off the light completely. Pressing the push button again will switch the low beam light back on. A brief touch of push button is used for headlight flashing.

When using a switch for light control, it's possible to toggle between high and low beam only. (Please refer to connection scheme.)

The light outputs (Light Hi Out / Light Low Out) can switch 120W each and are designed for a maximum load of two halogen bulbs with 55W (low beam) and 60W (high beam) respectively.

The parking light has to be activated under setup menu no. 12. The parking light is switched on, when on turning off the ignition the high beam light is activated. For the parking light feature, there is no need for an extra illuminant; the feature is realised with the existing illuminant for low beam / rear light. Parking light activation is signalised by two brief horn sounds. To avoid excessive battery discharge, please make sure, the parking light is switched on for 2h max.

Kill switch

The running engine can be stopped in three different ways:

a) Double-clicking of engine start button

Pressing the button again after engine stop will crank and start the engine in normal way.

b) Connecting a separate kill switch or push button at the "config" terminal. If a push button is used the engine is stopped if push button is shortly pressed. To release the kill function hold the button again for 2 seconds or switch ignition lock off and on again. If a kill switch is used wait for 2 seconds between switching engine off and release the kill switch.

c) When implementing controls with four push-buttons, the engine is killed by pressing the buttons for light and right turn indicator at the same simultaneously.

Alarm system

The sensitivity of the alarm system is independent of its positioning and orientation. If activated, the alarm system will flash all turn indicators when the main switch is deactivated. The vehicle's relative position and orientation will be recorded and stored and the alarm system engaged. The alarm is triggered when the orientation of the vehicle is changed on its X, Y or Z axis (e. g. when the vehicle is raised from its kickstand). Depending on the pre-set sensitivity, the alarm will also be triggered in case of lighter shocks or agitation resp. Depending on the chosen setup, the alarm system will trigger a pre-alarm and will only activate the alarm when the system is triggered again in a ten-second time frame.

If the vehicle is transported (e. g. by ferry, trailer or tow-truck) the alarm system can be deactivated non-recurring by pressing the horn button while switching disengaging the main switch.

If implemented within cars or sidecars, we recommend the highest sensitivity setting (option F).

Keyless Go

The pairing of m.unit and smart phone is a prerequisite of this feature. In the m.ride application, the feature can be activated / deactivated under „Garage/Fahrzeug_xy/Sicherheit/Keyless-Go/aktivieren“ (garage/vehicle_xy/safety/Keyless-Go/activate).

With active feature, the bike will be unlocked with a smart phone distance of less than approx. 4m. Pressing the start push button will switch on ignition, pressing it again will start the engine. Double-clicking the button will shut off the running engine, another double-click will shut off the ignition. When walking away from vehicle, the vehicle will be locked and the alarm system is activated (provided that it is enabled in setup menu).

Please make sure to carry the ignition key on you, so you can start the vehicle even without a smart phone.

Speedometer sensor

A speedometer sensor is required for matching the vehicle odometer with the m.garage app. In case the vehicle is equipped with speedometer sensor, connect the sensor signal cable to AUX2 input, and in setup menu 11, select option A.

In case the speedometer sensor is equipped with two connection cables, connect the ground cable to vehicle ground connection and the second cable to AUX2 input.

If no speedometer sensor is equipped, please use the provided reed sensor.

For signal detection, mount **one** of the provided magnets with glue to one wheel. In this case, the distance from magnet to wheel axle is irrelevant. Mount the speedometer sensor with a retaining plate in a way, that the surfaces of magnet and sensor tip are parallelly aligned with a 1mm gap. The reed sensor tip shall not be flush with the bracket; make sure, it is protruding from the bracket by approx. 5mm. The bracket may **not** be made from magnetizable materials (iron, steel etc.), but shall be made from aluminium, stainless steel or plastics. When driving under load, the distance between magnet and sensor may not vary! When rotating the wheel, no magnetizable material (e.g. a steel-made bolt) may pass the sensor tip.

The maximum tightening torque for the sensor mounting nuts is **1 Nm**. Please use thread lock (medium strength) for mounting. Connect the sensor cable to vehicle ground and the second cable to AUX2 input.

The vehicle speedometer signal is automatically calibrated. Therefore it is required, that the app is allowed to access the GPS receiver of your smart phone.

7 Mechanical Installation

Mount the device on a flat surface (metal base plate) free of tension using two M5 screws.

No push or pull force should act to the device. **Area of Installation must be protected from spray water** and 30cm away from hot engine or exhaust parts. Maximum ambient temperature must not exceed +80°C or go below -20°C.

All warranties and extended warranties will be deemed forfeit in case of mechanical damage to the device.

The m-Unit is connected to vehicle ground by the two mounting screws. Therefore one of the mounting screws must connected directly to battery minus terminal. The necessary cable cross section for this connection cable is 1.5mm².

8 Electrical Connection

8.1 General

The device is working in a voltage range between 6 to 18V direct current. Use in vehicles without battery is not possible.

Make sure that the vehicle is equipped with interference suppressed spark plugs or ignition cables. The minimum distance between ignition coil or high tension cables and m-Unit must not be below 30 cm.

8.2 Safety Functions

Currents in the range from 18-40V (e. g. in case of defective controller) will trigger the activation of the horn. This prevents unnoticed battery cook-off and damage to appliances due to continued driving.

Loose cables can release currents from 40-80V. In this range, the m-unit activates all appliances to protect itself. However, the resulting protection is only short term and prolonged (several seconds) or repeated currents surges will burn out the connected appliances (e. g. high or low beam light bulbs). When the current surge can no longer be compensated, burn out occurs and the respective output will become damaged permanently. Such damage is indicated by the defective/dysfunctional high or low beam outlet. In this case, all warranty claims will become forfeit.

Reverse polarity of the battery will cause the activation of all connected appliances to protect the m-unit.

PLEASE ENSURE TIGHT BATTERY CABLE CONNECTIONS. WHILE THE ENGINE IS RUNNING, LOOSE CONTACTS CAN CREATE STRONG CURRENT SURGES ABLE TO DAMAGE APPLIANCES AND M-UNIT BEYOND REPAIR.

8.3 Fuses

While the m-unit itself does not need a fuse, the implementation of a vehicle main fuse is mandatory since the voltage regulator (connected to the battery via the main fuse) might malfunction and create a short circuit.

If cables with a lesser diameter than indicated in Chapter 8.4 are connected (e. g. motogadget instruments or the m-lock), they have to be protected by the included fusible links.

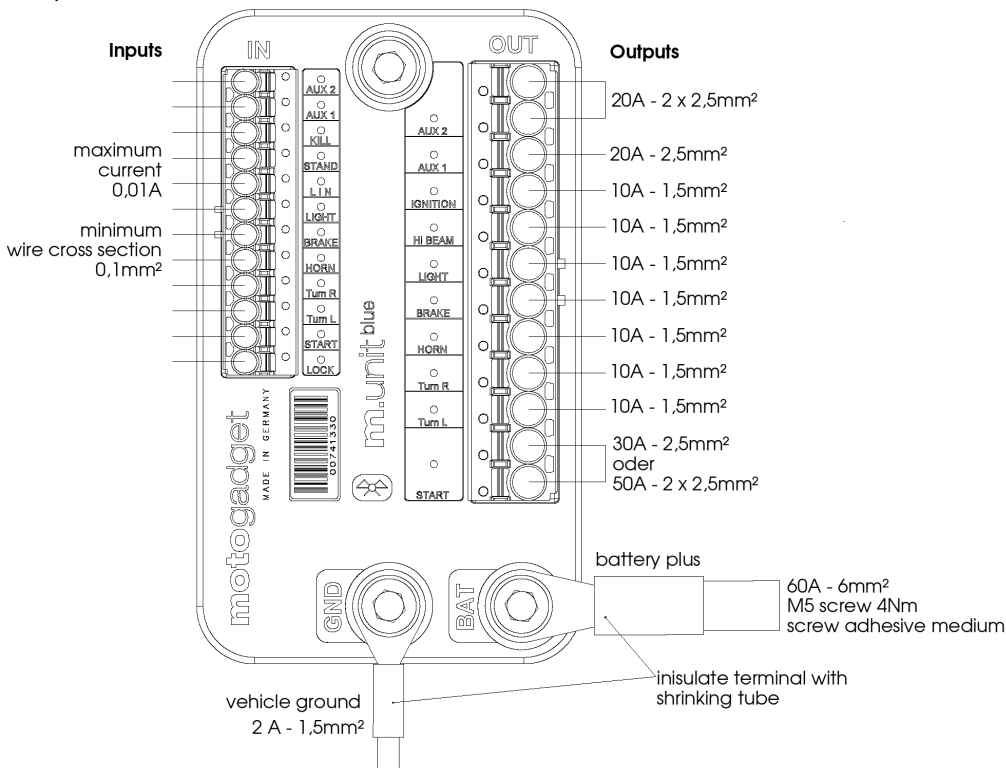
8.4 Cable Routing Recommendations

Cables used in vehicles must be suitable for this application. We recommend our cable kit (order # 4002031). Cable insulation must have an adequate thickness and insulation material must have a resistance against fuel, oil, cold and heat. Please use only cables which are certified for use in vehicles. Not fused wires which lead from battery positive terminal to starter motor or to m-Unit must have the shortest length possible. It is very important to protect the insulation of these cables against damage by wearing. At contact points between cable and vehicle parts additional insulation protection is necessary. Before routing cables look for suitable cable paths. The cables should be as far away as possible from hot parts of the engine. Look for a suitable place for the respective cables to meet with their plugs and for the plugs to be connected with one another. This is usually in the headlight housing, somewhere below the gas tank or in the cockpit. Make sure you take note of the required lengths of cables before cutting them for best fit. It is important here to consider the full lock of the handlebars as well as the front and rear wheel travel. All cables should be routed free of kinks and should not be subject to any tension. In addition, the cables have to be properly isolated, especially in places where mechanical wear can take place. We recommend solder joints. For fastening the cables we recommend cable ties of synthetic material.

The cables are connected to m.unit using spring terminal blocks. Push down the orange coloured insert next to the cable entry to insert the exposed cable end into the terminal block. Use a screwdriver tip to push down the insert.

8.5 Wire Cross Sections

Wire diameters used in a circuit are dependant on the current flow that particular circuit. Following plan shows the minimum wire cross sections used in the single circuits of m-Unit. The installed wire cross sections must not go below the shown values.



8.6 Connecting Battery's Positive Terminal

Cable connection has to be carried out as shown in the drawing at the right side. The minimum wire cross section must not go below 10mm². The cable end has to be supplied with an eyelet and will be mounted with a M5 screw to the m-Unit. The maximum torque applied to the M5 fastening screws must not exceed 4 Nm. Screw adhesive medium strength **must** be applied to the screw prior installation.

MAKE SURE THE EYELET IS INSULATED IN A PROPER WAY AND CANNOT GET IN CONTACT TO OTHER PARTS CONNECTED TO VEHICLE GROUND.

8.7 Handle Bar Controls

Three different types of handle bar controls are compatible with m-Unit. The particular type which will be used with m-unit must set in the setup menu.

Configuration A) – 5-push button controls

- | | |
|------------------------|---------------|
| - turn lights left | - push button |
| - turn lights right | - push button |
| - low beam / high beam | - push button |
| - start | - push button |
| - horn | - push button |

Configuration B) – Harley Davidson and BMW controls

- | | |
|------------------------|---------------|
| - turn lights left | - push button |
| - turn light right | - push button |
| - low beam / high beam | - switch |
| - start | - push button |
| - horn | - push button |

Configuration C) – most Japanese and European motorcycles

- | | |
|----------------------------|----------------|
| - turn lights left / right | - 3 way switch |
| - low beam / high beam | - switch |
| - start | - push button |
| - horn | - push button |

configuration D) – new Ducati models

- | | |
|----------------------------|----------------|
| - turn lights left / right | - 3 way switch |
| - low beam / high beam | - push button |
| - start | - push button |
| - horn | - push button |

configuration E) – 4-push-button controls

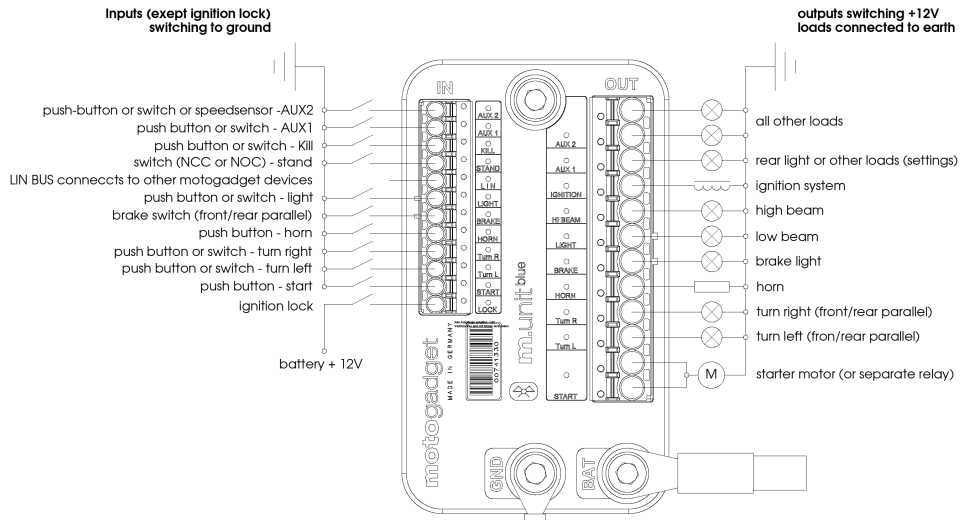
- | | |
|------------------------|-------------------------------------|
| - turn lights left | - push button |
| - turn lights right | - push button |
| - low beam / high beam | - push button |
| - horn | - push button |
| - start | = left turn + light simultaneously |
| - kill switch | = right turn + light simultaneously |

In case of using the OEM handle bar controls together with m-Unit; head light flashing push button is not applicable. There is also no possibility to switch the parking light by the m-Unit.

Additional safety switches like side stand switch have to be connected as shown in chapter 8.9.

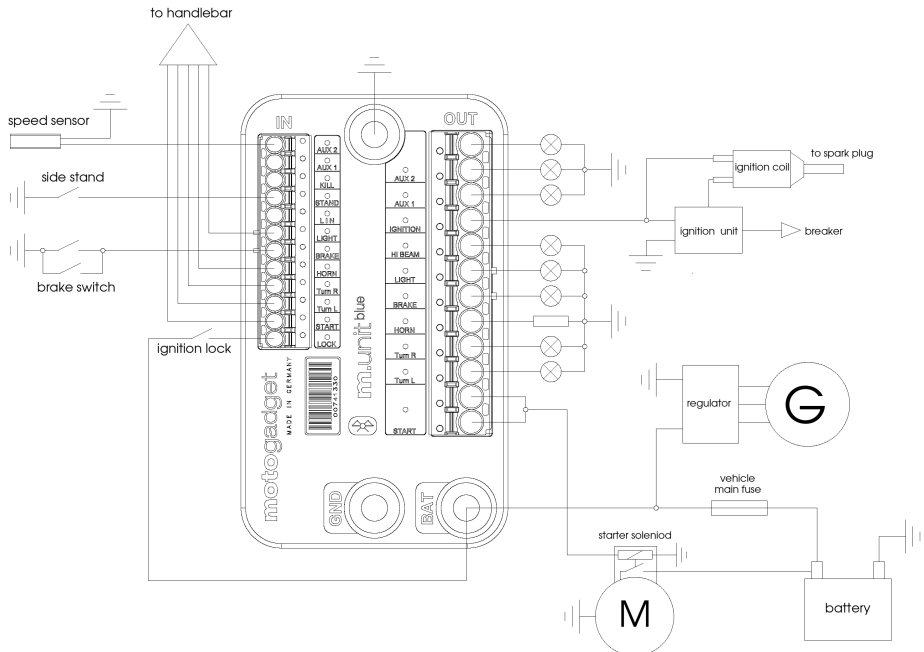
7.8 Connecting Load Circuits

The m-Unit provides 8 independent circuits which are permanently supervised. At all connected loads were the positive terminal switched, that means, from m-Unit's output terminal lead one cable to the load which is connected to vehicles earth. At the particular output only the intended load must be connected. The connection scheme is shown on next page. If control lamps will be used; these have to be connected in parallel to the load as shown in chapter 7.9



Simplified vehicle circuit diagram

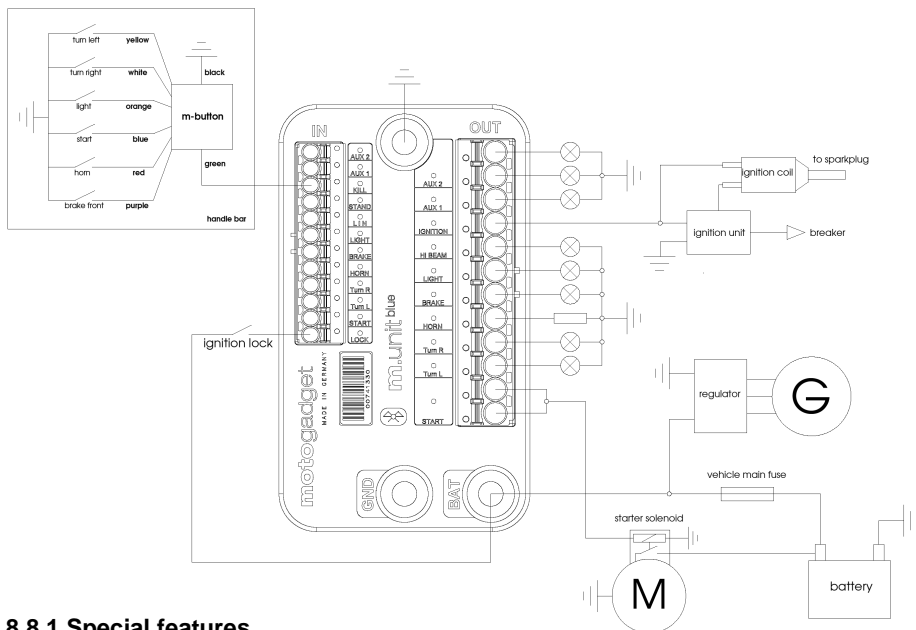
The circuit diagram below shows a simplified vehicle wiring loom.



Simplified vehicle circuit diagram with m-Button (optional accessory)

The circuit diagram below shows a simplified vehicle wiring loom with use of the m-button. Therefore 6 wires do not apply, because only one cable is needed to connect handle bar controls with m-unit.

THE M-BUTTON MUST LOCATED INSIDE A METAL HANDLEBAR TUBE.



8.8.1 Special features

START Output

The starter output consists of two connection terminals. Starters with integrated solenoid (magnetic switch) with a current flow of maximum 30A (e.g. Valeo, Bosch, Harley Davidson), are connected using a connection cable with 2,5mm² cross-section to one of the two outputs. Starters with a solenoid generating currents up to 50A will require both connecting terminals using cables with 2,5mm² cross-section.

All starters with separate starter relays (e.g. Japanese models) must continue to be operated using the original starter relay. In this case, the output „start“ is connected to the relay which switches the actual cranking current (>100A). On some vehicles, this starter relay is switched using a second relay for protection of start push button. This second relay will become obsolete.

IGNITION Output

This output powers the ignition system. **The ignition system must be connected to this output only.**

AUX1 Output

All loads like rear light, license plate light, radio, heated grips etc. are powered by this output. In setup menu, different configurations of this output are possible depending on the use.

AUX 2 Output

This output is designed for multiple use and equipped with 2 connecting terminals. Depending on configuration, AUX2 input can be used for switching operations (via button / switch), or switching can be automatically performed.

Ignition Lock

When using m-Lock as ignition lock, the m-Lock switching output (brown cable) can be connected directly to the m.unit input **LOCK**.

NOTE:

For older Japanese models, resistors can be integrated into the ignition lock (simplified anti-theft protection). When bridging or removing the ignition lock, the ignition system will not generate a spark, before a specific cable, directly routed from ignition unit to ignition lock, is switched to ground or high side (+) using an external resistor. The required resistor can be ordered in regular stores; the resistor value is determined by measurements.

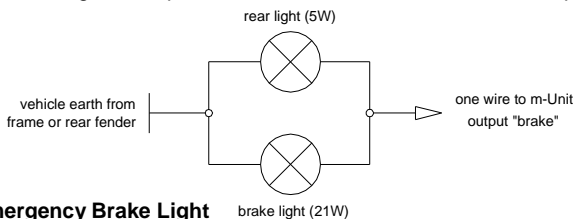
If the vehicle is equipped with an immobiliser, in most cases this feature will be deactivated via a built-in transponder inside the ignition key. In this case, the ignition lock can not be bridged or removed.

According to German Road Traffic Licensing Regulation (StVZo), the vehicle has to be equipped with a steering lock. If ignition lock and steering lock are built as one unit, please clarify in advance, if you are allowed to carry the lock separately on you (e.g. as a brake disc lock), which requires the registration in vehicle documents).

One-wire Rear Light

With default wiring, the **BRAKE** output is connected to brake light, and the rear light is connected to **AUX1** output.

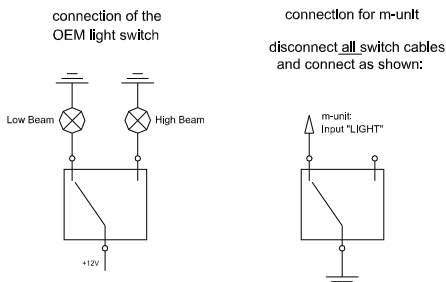
If you like to connect rear light and brake light with one common wire, please select the correct setting in setup menu no. 2 (refer to chapter 8). In this case, rear light and brake light will be switched together in parallel and connected to the common output „Brake“.



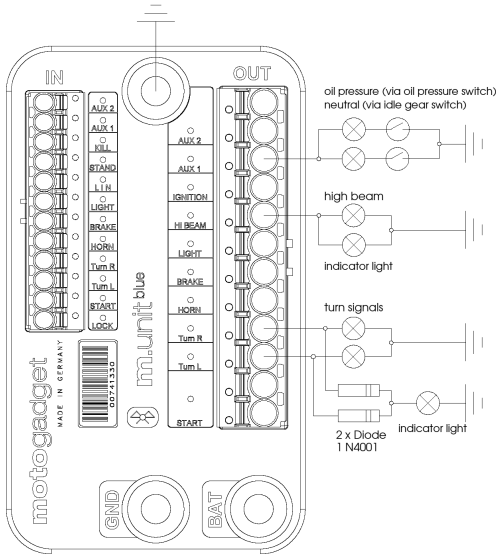
Emergency Brake Light

In this configuration (menu 4 / option G), a detected deceleration of more than 8m/s^2 that exceeds a 1000ms time period, will be considered as an emergency braking event. The braking light will pulse with 5Hz and the hazard lights are active while braking. This is used to prevent collisions by giving clearly visible warning signals to the traffic behind you.

Use of original light toggle switch with m.unit



8.9 Connecting Indicator Lights



9 Setup

9.1 Layout

Device setup is structured in menus (1–12) with selectable options (A–J) as follows:

Menu 1 – Handlebar Instruments

- A) configuration A (use of 5 push buttons)
- B) configuration B (HD and BMW)
- C) configuration C (Japanese and various European motorbikes)
- D) configuration D (new Ducati models)
- E) configuration E (use of 4 push buttons)

Menu 2 – Rear light configuration

- A) standard (brake light connected to *Brake* and rear light to *AUX1*)
- B) one wire rear light / brake light for LED
- C) one wire rear light / brake light for light bulbs

Menu 3 – Turn signal configuration

- A) no automatic shut-down
- B) shut-down after 10s
- C) shut-down after 15s
- D) shut-down after 20s
- E) shut-down after 25s
- F) shut-down after 30s
- G) shut-down after 35s
- H) shut-down after 40s
- I) shut-down after 45s
- J) shut-down after 50s

Menu 4 – Brake light configuration

- A) standard (continuous light)
- B) fade in and fade out with 3Hz
- C) flashing with 5Hz
- D) 8 times flashing with 5Hz and continuous light
- E) 2 times flashing and 1s continuous light, and start again
- F) 3s continuous light and flashing with 5Hz
- G) emergency braking – flashing with 5Hz and hazard lights

Menu 5 – Alarm configuration

- A) alarm deactivated
- B) silent alarm (alarm events are displayed in m.ride app only)
- C) pre-alarm 10s, low sensitivity
- D) pre-alarm 10s, medium sensitivity
- E) pre-alarm 10s, high sensitivity
- F) pre-alarm 10s, maximum sensitivity
- G) low sensitivity
- H) medium sensitivity
- I) high sensitivity
- J) maximum sensitivity

Menu 6 – Turn signals as position lights (Low Light)

- A) function deactivated
- B) brightness 10%
- C) brightness 15%
- D) brightness 20%
- E) brightness 25%
- F) brightness 30%
- G) brightness 35%
- H) brightness 40%
- I) brightness 45%
- J) brightness 50%

Menu 7 – m-Wave flashing sequence (smooth turn signal)

- A) function deactivated
- B) function activated

Menu 8 – Light configuration

- A) lights on after engine start
- B) lights on with ignition ON
- C) manual switch-on (light switch)
- D) lights on after engine start and off with kill pressed
- E) lights on after engine start and off after 20s of ignition OFF (garage light)

Menu 9 – AUX1

- A) use as rear light output (active, when light is active)
- B) active with ignition ON
- C) active after engine start
- D) ON / OFF with push button connected to input AUX1
- E) ON / OFF with switch connected to input AUX1

Menu 10 – AUX2

- A) active with ignition ON
- B) active after engine start
- C) ON / OFF with push button connected to input AUX2
- D) ON / OFF with switch connected to input AUX2

Menu 11 – Side stand

- A) input *Stand* used as N/C contact (engine start enabled when input is open)
- B) input *Stand* used as N/O contact (engine start enabled when input switched to ground)

Menu 12 – Parking light

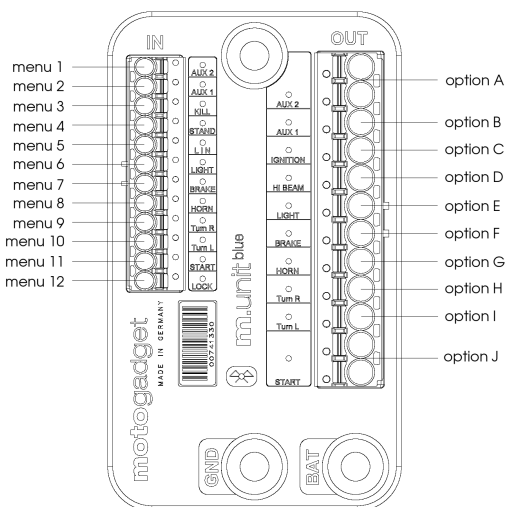
- A) deactive
- B) active
- C) 1h active
- D) 3h active
- E) 6h active

9.2 Starting setup

To start setup, press the horn push button 3 times briefly right after switching on the ignition. If the horn sounds, please press the button faster.

9.3 Navigation in setup

LEDs on input side represent the menus 1 to 12. All LEDs on output side display the options A to J of the selected menu. The LED flashing sequence displays the currently active menu item or selectable option, respectively. Press the push button briefly to switch to next menu / option. Press the push button for an extended time (2s) to toggle between menu and option. The drawing below contains an overview of all menus and selectable options.



9.4 Exit from setup

Press and hold the push button until the device changes back to normal operation mode.

9.4.1 Calibration

When exiting from setup, m.unit calibrates to be able to detect defective illuminants while operating. To do so, the outputs *TurnR*, *TurnL*, *Light*, *Highbeam*, *Brake* and *AUX1* are switched on one after the other to measure the individual currents applied on each output.

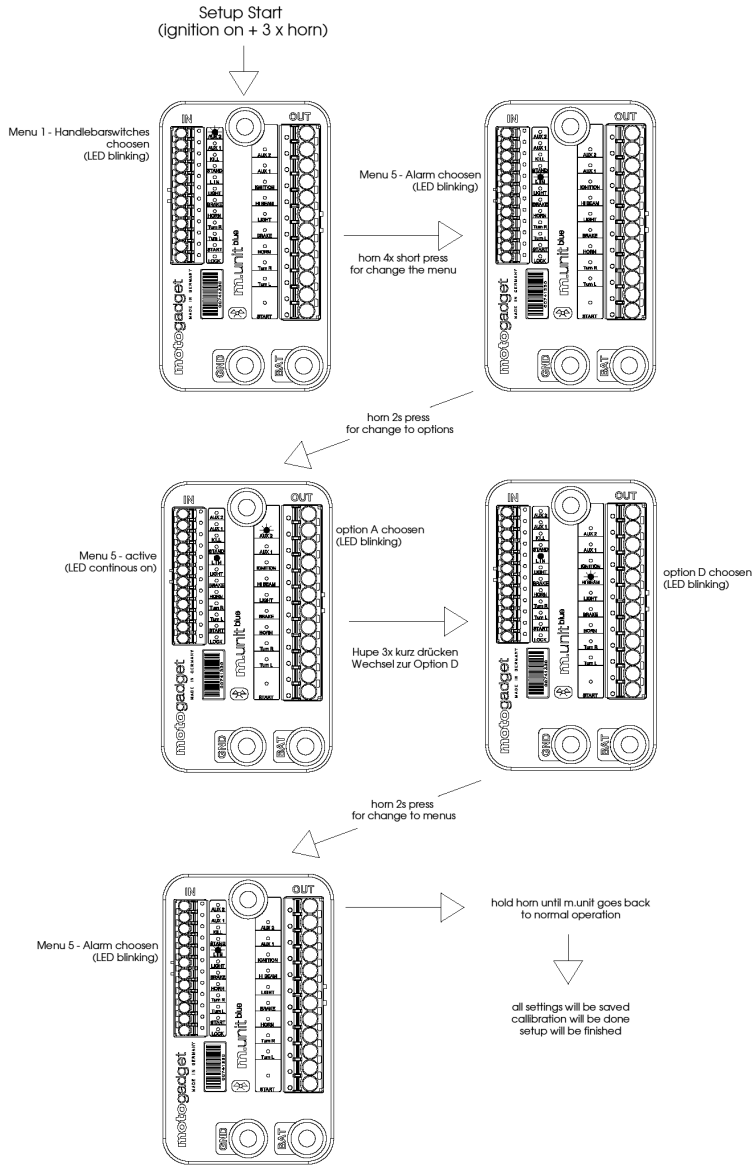
In case of a defective illuminant, a message will be transmitted to the *m.ride* app and, if possible, the change to a different illuminant will be executed (low beam / high beam or rear light / brake

light, respectively). In case of a defective turn signal light, according to legal regulations the flashing frequency will be doubled.

Therefore, every time the existing wiring is changed or a different illuminant is used, the setup needs to be started for re-calibration and exited.

9.5 Example for Setup

The following example is demonstrating the operation in setup mode. Alarm is deactivated. The example shows how to set it to option D (pre-alarm 10s, medium sensitivity).



10 Pairing m.unit with a smart phone

To be able to connect the m.unit to your smart phone, you will have to install the *m.garage* app first. In the app, create the vehicle first, and then in the menu *Custom Parts*, select the manufacturer „motogadget“ and „m.unit blue“.

Under the app menu item *Setup*, click on *Pairing*. Now, start the m.unit setup (ignition ON and press the horn push button 3 times). Press and hold the start push button for 10s. If you are not using a start push button (i.e. kick-start), connect input *Start* to ground for 10s.

Now, m.unit will connect to your smart phone; please observe the instructions / notes on your smart phone.

11 Trouble-shooting

11.1 After installation and on initial start-up

- Please make sure, the battery provides a sufficient voltage of 12.4V minimum (ignition OFF).
- Check that the ground connection between mounting bolt of m-Unit and battery negative terminal (vehicle ground) is established in an optimal way.
- Do not use a battery charger to check the device functionality.
- Due to permanently applied, low voltages, it is not possible to measure the voltages at the inputs and outputs. These voltage values do not provide any informations in terms of the correct functionality of the input / output. A functional test has always to be executed using a suitable load (e.g. a light bulb).
- Check all cables for correct connection and contact, proper polarity, short-circuit and short-circuit to ground.

Error	Reason	Action
Alarm system not functioning	Feature is not activated	Set setup menu item 5 to option C–J
When actuating the starter, m-unit switches off and re-starts (chaser light is displayed)	Battery voltage collapses when attempting to start the engine	Check connecting cables, charge battery or replace battery (if necessary)
When attempting to start, m-unit switches off the starter output (LED is flashing)	poor electrical connection between vehicle ground and connector pin of m-unit	route a separate cable from battery negative terminal to one of the connector pins
	Current flow through starter or original starter relay too high	use of separate starter relay
	poor electrical connection between battery and vehicle's electrical system	establish suitable connection, use suitable ground cable
m-unit switches off the electrical consumer (LED is flashing)	poor electrical connection between vehicle ground and connector pin	route a separate cable from battery negative terminal to one of the connector pins
	poor electrical connection at connecting terminal of m.unit	use end ferrules, check cable cross-section, re-connect cable
	current flow of load too high	connect suitable load (bulb, 2x 60W max.)
	short-circuit on output	eliminate short-circuit
both turn signals are lit / glowing permanently	position lights are activated	Set setup menu item 6 to option A

11.2 Return And Complain

When returning your m.unit for technical inspection, please follow the link below:

<http://motogadget.com/de/repairinquiry>

The *motogadget* team wishes you pleasant and safe riding, and lots of fun with your new *m.unit*.

CE marking

The unit described in this document is in accordance with the official European directives. A copy of the declaration of conformity can be provided on request. This equipment complies with the essential requirements of EU Directive 1999/5/EC. The vehicle body control module integrated in this product has been pre-certified separately and is marked with CE0168 R&TTE directive.

Hereby, motogadget declares that motogadget products and accessories are in compliance with the essential requirements and other relevant provisions of the EU Directive 1999/5/EC.

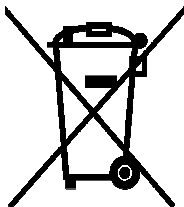
WEEE directive

The wheelee bin symbol on the product or its packaging indicates that this product shall not be treated as household waste. In line with EU Directive 2002/96/EC for waste electrical and electronic equipment (WEEE), this electrical product must not be disposed of as unsorted municipal waste. Please dispose of this product by returning it to the point of sale or to your local municipal collec-tion point for recycling. By doing this you will help conserve the environment.

Regulations

PRODUCT INFORMATION:

Manufacturer:	motogadget GmbH
Model:	m.unit_blue
FCC ID:	2AIF8-4002040
IC:	21495-4002040



FCC COMPLIANCE STATEMENT:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver
- Connect the equipment to outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

Canada – Industry Canada (IC)

This device complies with Industry Canada license-exempt RSS Standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interference, y compris celles pouvant causer un mauvais fonctionnement de l'appareil.