EN

Instruction Manual
m.unit blue

only valid from serial no. 00044800
(refer to serial sticker on the device)

V1.8

Thank you very much for purchasing a high quality *motogadget* product - made in Germany.

! CAUTION !

THIS PRODUCT OPERATES ON STRONG CURRENTS. CONNECTION FAILURE MAY LEAD TO CABLE FIRE OR EXPLOSION OF THE VEHICLE'S BATTERY. THERE IS A RISK OF SEVERE 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 following information and recommendations **thoroughly** and follow these instructions during installation and use of the instrument. No liability shall be assumed by *motogadget* for damage or defects resulting from negligence or failure to follow the operating and installation guide.

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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 at: 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 shall not assume any liability for returns which are insufficiently insured or packed.

2 Exclusion of Liability

THE M.UNIT OPERATES STRONG CURRENTS. FAULTY CONNECTION MAY LEAD TO CABLE FIRE OR EXPLOSION OF THE VEHICLE'S BATTERY. THERE IS A RISK OF SERIOUS OR LETHAL INJURIES. A MAIN VEHICLE FUSE (MAXIMUM 40A) MUST USED. THE DEVICE AND ITS ACCESSORIES MUST BE INSTALLED BY A CERTIFIED MOTORCYCLE TECHNICAN AND IN AN AUTHORISED SERVICE CENTER.

REVERSE POLARITY OR VOLTAGE ABOVE 25V MAY RESULT IN DAMAGE TO THE M.UNIT. THE DEVICE THEN HAS TO BE REPLACED AND ALL WARRANTY CLAIMS SHALL BECOME INVALID.

MOTOGADGET SHALL ACCEPT NO LIABILITY FOR DIRECT OR INDIRECT DAMAGE OR SUBSEQUENT DAMAGE OF ANY KIND RESULTING FROM THE USE, INSTALLATION OR CONNECTION OF THE DEVICE OR OTHER DELIVERED EQUIPMENT. THIS EXCLUSION OF LIABILITY PARTICULARLY INCLUDES DAMAGE TO PERSONS, MATERIAL LOSSES AND FINANCIAL DAMAGES. THE USE IN AREAS OF PUBLIC TRAFFIC SHALL ENSUE AT THE USER'S OWN RISK.

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

3 Safety Instructions

- **THE VEHICLE BATTERY MUST BE COMPLETELY DISCONNECTED PRIOR TO ANY WORK ON THE VEHICLE'S ELECTRICAL SYSTEM. FIRST DISCONNECT THE NEGATIVE TERMINAL AND THEN THE POSITIVE TERMINAL. FOR RECONNECTION, PROCEED IN THE REVERSE ORDER.**
- **USE OF M.UNIT WITH PLUS POLE CONNECTED TO VEHICLE FRAME (OLDER ENGLISH MOTORCYCLES) IS NOT POSSIBLE.**
- **INSTALLATION AND ELECTRICAL CONNECTION OF THE M.UNIT MAY ONLY BE CARRIED OUT BY A CERTIFIED MOTORCYCLE TECHNICIAN.**
- **ALL CABLE DIAMETERS MUST BE DIMENSIONED ACCORDING THE CURRENT FLOW (REFER TO CHAPTER 8.5).**
- **ALL ELECTRICAL CONNECTIONS IN THE WIRING LOOM AND AT THE CONNECTION TERMINALS HAVE TO BE CARRIED OUT PROFESSIONALLY. FAILURES AT CONNECTING JOINTS MAY CAUSE A CONTACT RESISTANCE AND LEAD TO HEAT GENERATION DURING HIGH CURRENT FLOW. THERE IS A RISK OF SERIOUS OR LETHAL INJURIES.**

- **THE DEVICE WILL BECOME DAMAGED BEYOND REPAIR IF A BATTERY CABLE IS DISCONNECTED (DUE TO LOOSE OR WORN CONTACT, ETC) WHILE THE ENGINE IS RUNNING. PLEASE MAKE SURE THAT THE VEHICLE'S BATTERY IS CONNECTED CORRECTLY AND THAT THE CONNECTOR CABLES ARE FIXED TIGHTLY.**

4 Duty of Registration

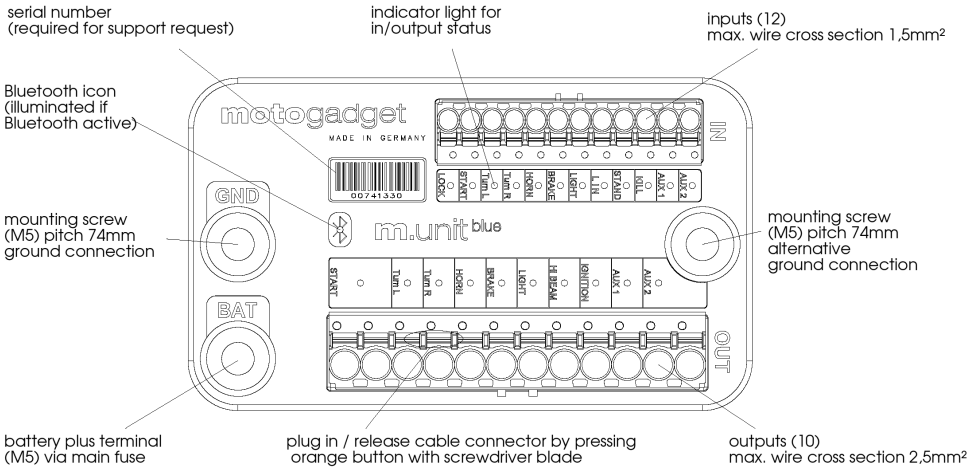
The m.unit blue does not have to be registered. The user is responsible that his chosen settings for the vehicle lighting conform to the laws in the country of use. This must be checked in each case by the user before starting the device.

5 Technical Data and Functions

5.1 General Data

Length / width / depth	90 / 53 / 30 mm
Weight	110 g
Threaded fastening bores	2 x M5, bore spacing 74 mm
Standby current	approx. 450 µA (0.00045 A)
Operating voltage	6 - 18V, suitable for 12V electrical systems
Operating temperature	-20°... + 80°C
Input circuits	12
Output circuits	10 (*START* and *AUX2* with 2 wire terminals each)
Display	23 internal LEDs

5.2. Overview



6 Functions and Operation

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

- Complete digital pushbutton control unit; optional 4 or 5 pushbutton operation
- Complete replacement of all OEM fuses. 10 independent circuits are digitally supervised; a circuit will be shut down in case of interferences. On removing the interference, the safety feature will be automatically reset
- Integrated, digital, load-independent flasher relay; with programmable switch-off feature (optional), selectable m-wave mode
- Direction indicator setting for use as position light
- Parking light, high beam 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 and high beam control (up to 200W switching power) using just one pushbutton
- Integrated digital horn relay
- Integrated position-independent alarm system
- Integrated hazard light feature
- Diagnostic feature for layout of input, output, circuit switching status plus diagnosis of electrical circuit, short-circuits, etc.
- Two fully configurable auxiliary outputs AUX1 and AUX2
- calibration and current monitoring allows defect detection of all lights and blinkers

Connecting with your smartphone and the *m.ride* app provides advanced functionality:

- pairing via an encrypted Bluetooth LE (Low Energy) connection; thus a secure and extremely low power consumption for both vehicle and smartphone
- Keyless-Go, unlock your bikes electrical system when approaching with smartphone
- Reporting of alarm events (date, time, vehicle "down" etc.)
- Real-time fault indication via audio voice to head-set
- Manual switching of outputs (except starter)
- Firmware updates from any location
- Configuration of m.unit setup menu
- The m.unit's speedometer input for storage and matching of vehicle's odometer allows for vehicle management with automatic notifications of maintenance tasks and status of wheels, chain, brake pads, oils, operating supplies, spark-plugs, etc.
- Status, alarm, driver and maintenance logbook
- Display of parking position and "ping!" feature for locating your vehicle

The m.unit is made of a newly designed high-performance thermosetting plastic and is 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, such as a short-circuit, the connection circuit affected is instantly shut down. All switching activities are performed by state-of-the-art semiconductor switches in a fast, wear-free and almost lossfree way.

No other devices, relays, boxes or units as part of the wiring harness are therefore necessary. A complete new and minimised vehicle wiring can be undertaken with minimal time, materials and effort. Compared to conventional solutions, only a fraction of the space and cables is needed. State-of-the-art technology, such as pulse-width modulation, requires only one cable for connecting the rear and brake light. When using the m.button, the number of handlebar instrument connections are 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

Direction indicators

Automatic shut-off can be activated in the setup menu. If this feature is activated, a countdown will start once the signal is flashing. When the set countdown has ended, the direction indicators stop flashing. Activating the brake stops the countdown. Releasing the brake restarts the countdown in its full time length. If pushbuttons are used for the direction indicator control and a timeout has been selected in the setup, a brief pressing of the pushbutton activates the lane change function. Pressing and holding down the pushbutton for longer than one second deactivates the countdown.

Hazard light

To activate the hazard light, press and hold down the pushbuttons for left and right direction indicators for 2 seconds. If a direction indicator 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 vehicle's battery power, the high beam is switched off after ignition. The low beam is activated automatically after ignition. Further light control modes can be selected under Setup Menu no. 8.

If a pushbutton is used for high/low beam control, a short press will toggle between high and low beam. Pressing the pushbutton down for 2 seconds will switch the lights off completely. Pressing the push button again will switch the low beam back on. A short press of the pushbutton will activate high beam flashing.

When using a switch for light control, it is only possible to toggle between high and low beam. (please refer to connection diagram)

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 is activated under Setup Menu no. 12. The parking light is switched on, when the high beam is on when the ignition is turned off. For this purpose, no extra parking lamp is required – this function is realised with the existing low beam and rear light. Parking light activation is signalised by two brief horn sounds. To avoid excessive battery discharge, please ensure that the parking light is switched on for a maximum of 2 hours.

Kill switch

The running engine can be shut off in three different ways:

a) Double-clicking on the engine start button
Pressing the button again will start the engine again.

b) Connecting a separate kill switch or a pushbutton at the "KILL input. If a pushbutton is used, the engine is shut off if the pushbutton is briefly pressed. To restart the engine, hold the button again for 2 seconds or switch the ignition on again. If a kill switch is used, wait for 2 seconds after switching the engine off before releasing the kill switch.

c) When implementing controls with four push-buttons and choose the setup menu 1 / option E, the engine is shut off by pressing the pushbuttons for the right indicator and the lights at the same time.

Alarm system

The sensitivity of the alarm system is independent of its positioning and orientation. On switching off the ignition, an activated alarm system is displayed by the indicators briefly flashing. The vehicle's relative position and orientation will be recorded and stored and the alarm system engaged after 30s. 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 response. 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 the m.unit with a smartphone is a prerequisite of this feature. In the ***m.ride*** app, the feature can be activated or deactivated. With this feature active, the vehicle will be unlocked with a smartphone distance of less than approx. 2m.

Pressing the start pushbutton will switch on the 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 the vehicle, the vehicle will be locked and the alarm system activated (provided that it is activated in the setup menu).

Please make sure to carry the ignition key on you, so you can start the vehicle even without your smartphone.

Speedometer sensor

A speedometer sensor is required for matching the vehicle odometer with ***m.ride***. If the vehicle is equipped with a speedometer sensor, connect the sensor signal cable to the AUX2 input, and select option A or B in Setup Menu 11.

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

If no OEM speedometer sensor is equipped, please use the sensor provided.
For signal detection, mount **one** of the provided magnets with glue to one of the wheels. In this case, the distance from magnet to wheel axle is irrelevant. Mount the speedometer sensor with a retaining plate in such a way, that the surfaces of magnet and sensor tip are parallelly aligned with a 1mm gap. The reed sensor tip should not be flush with the bracket; make sure, it protrudes from the bracket by approx. 5mm. The bracket may **not** be made from a magnetisable material (iron, steel, etc.), but instead from from aluminium, stainless steel or plastics. When driving under load, the distance between magnet and sensor may not vary! When rotating the wheel, no magnetisable material (e.g. a steel-made bolt) may brush over 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 the vehicle ground and the second cable to the AUX2 input.

To calibrate the speed sensor of the m.unit, ride 50km/h precisely and the press the horn rapidly 3 times. The calibration process will take 5s and is indicated by the flashing of the blinkers. It is required to keep a constant speed for the entire calibration process.

7 Mechanical Installation

Mount the device on a flat surface (metal base plate) free of tension using two M5 screws. No tensile or compressive force must be acting on the device housing. All warranties and extended warranties shall be deemed forfeit in the event of mechanical damage to the device.

The area of installation must be protected from spray water and a distance of 20cm away from hot engine or exhaust parts. Maximum ambient temperature must not exceed +80℃ or go below -20℃.

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

8 Electrical Connection

8.1 General aspects

The device works in a voltage range between 6 to 16V DC (direct current) and is made for 12V electrical systems which use battery minus terminal to vehicle frame. Use in vehicles without a 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 less than 10 cm.

8.2 Safety Functions

The overvoltage notification will trigger the horn when the voltage surpasses 16V - 40V (e.g. in case of defective regulator). This prevents unnoticed battery cook-off and damage to appliances due to continued riding.

Loose battery cables result in voltage spikes up to 80V. In this case, the m.unit activates all appliances to protect itself. However, the resulting protection is only short-term – prolonged (several seconds) or repeated voltage surges will burn out the connected appliances (e. g. low or high beam bulbs). When the voltage surge can no longer be compensated, burn out occurs and the respective output will become damaged permanently. Such damage is indicated by the defective low or high beam outlet. In this case, all warranty claims shall become forfeit.

Reversing the 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 voltage spikes 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 main vehicle fuse (maximum 40A) is mandatory, since the voltage regulator (connected to the battery via the main fuse) may malfunction and create a short circuit.

If cables are connected with a lesser diameter than indicated in chapter 8.5 (e.g. motogadget instruments or the m.lock), they have to be protected by the cable fuses supplied.

8.4 Note on Cable Routing and Connecting

Cables used in vehicles must be suitable for this application. We recommend our cable kit (order # 4002031). Cable insulation must possess a adequate thickness and the insulation material must have a resistance against fuel, oil, cold and heat. Please use only cables which are certified for use in vehicles.

Non-fused positive leads, which lead from battery positive terminal to the starter motor or the m.unit must have the shortest length possible. It is very important to protect the insulation of these cables against damage by wear. Additional insulation protection is necessary at the contact points between cables and vehicle parts. Before routing cables, look for suitable cable paths. The cables should be as far away as possible from hot parts of the engine.

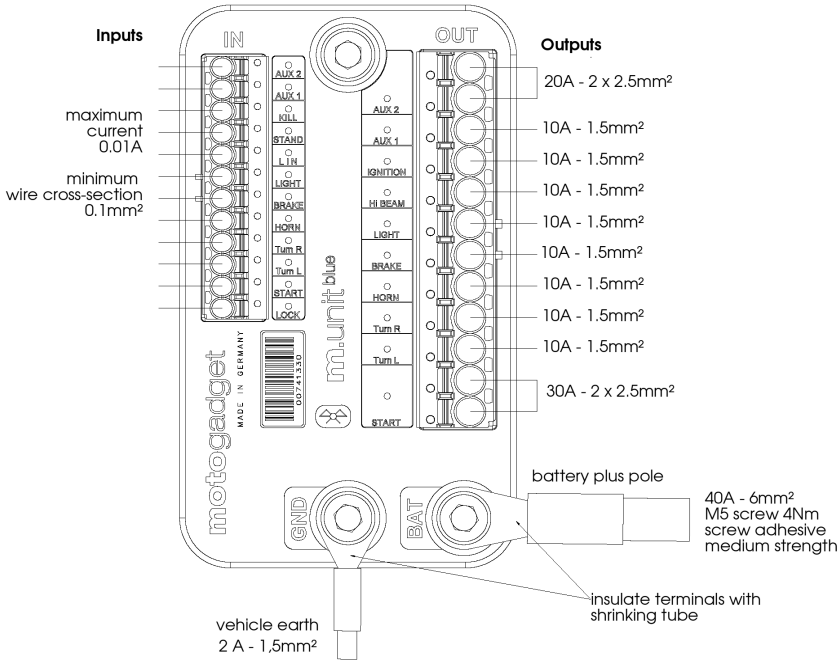
Look for a suitable place for the respective cables to connect with their plugs and for the plugs to be connected with each other. You will usually find this in the head lamp housing, below the gas tank or in the cockpit. Make sure you take note of the required lengths of cables before cutting them for best fit. In this regard, it is important 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. For fastening the cables, we recommend cable ties made of plastic material.

The cables are connected to m.unit using spring terminal blocks. Press 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 in that particular circuit. The following plan shows the minimum wire cross-sections used in the single circuits of the m-unit. The installed wire cross-sections must not be less than the shown values.



8.6 Connecting Positive Terminal of Battery

Cable connection has to be carried out as shown in the drawing. The minimum wire cross-section must not be less than 10mm². The battery cable end has to be crimped on an M5 eyelet and be mounted to the m.unit using a M5 screw. The maximum torque applied to the M5 fastening screw must not exceed 4 Nm**.** Screw adhesive of medium strength **must** be applied to the screw prior to installation.

If the provided battery cable is used, mount the end with eyelet with the short M5 screw at the m.unit. Cut the other cable end to required length and crimp the provided eyelet to this end. Use a suitable crimping tool. Use the provided shrinking tube to cover any exposed metal.

MAKE SURE THE EYELET IS SUFFICIENTLY INSULATED AND CANNOT MAKE CONTACT TO OTHER PARTS CONNECTED TO THE VEHICLE EARTH.

8.7 Handle Bar Controls

All inputs terminals, except terminal *lock,* requiring a earth signal. Five different types of handle bar controls are compatible with the m.unit. The particular type to be used with the m.unit must be set in the setup menu as follows:

Configuration A) – 5-push button controls

- Left indicator - pushbutton
- Right indicator - pushbutton
- Low/high beam - pushbutton
- Starter - pushbutton
- Horn - pushbutton

Configuration B) – Harley Davidson and BMW controls

- Left indicator - pushbutton
- Right indicator - pushbutton
- Low/high beam - switch
- Starter - pushbutton
- Horn - pushbutton

Configuration C) – most Japanese and European motorcycles

- Left/Right indicator - 3-way switch
- Low/high beam - switch
- Starter - pushbutton
- Horn - pushbutton

Configuration D) – new Ducati models

- Left/Right indicator - 3-way switch
- Low/high beam - pushbutton
- Starter - pushbutton
- Horn - pushbutton

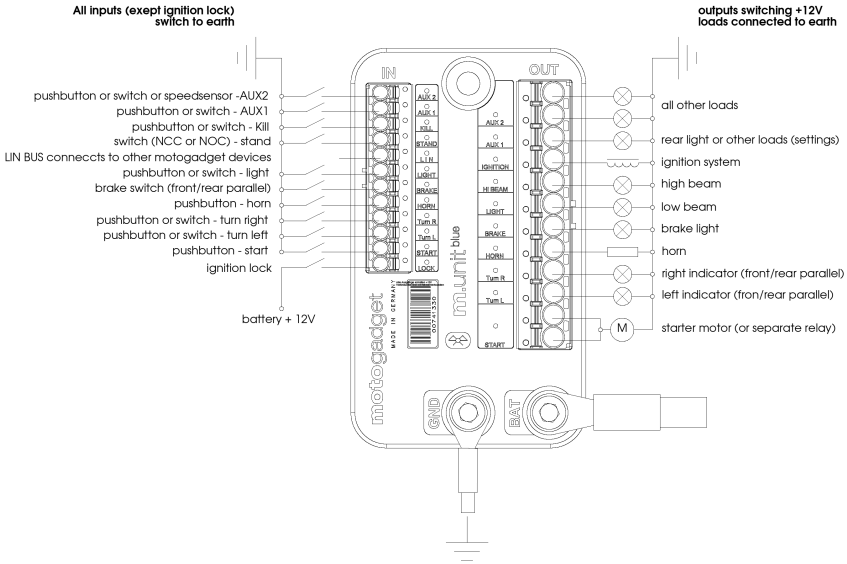
Configuration E) – 4-pushbutton controls

- Left indicator - pushbutton
- Right indicator - pushbutton
- Low/high beam - pushbutton
- Horn - pushbutton
- Starter = press left indicator + light simultaneously
- Kill switch = press right indicator + light simultaneously

When using the OEM handle bar controls together with the m-unit, the high beam flashing pushbutton is not applicable. A side-stand switch has to be connected to input terminal *Stand.*

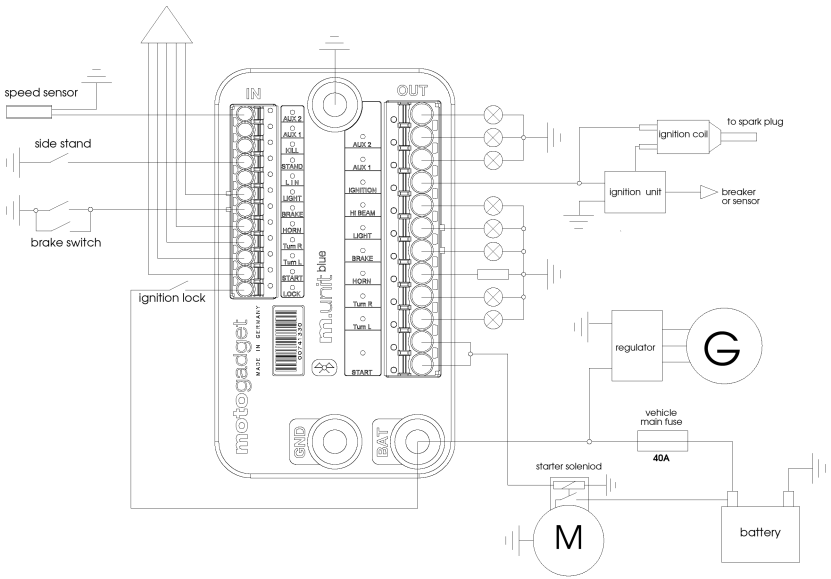
8.8 Connecting Load Circuits

The m-unit provides 10 independent and permanently monitored circuits. The positive terminal is switched for all connected loads, i.e., a cable runs from each circuit to the corresponding load, which connected to earth. Only the intended load may be connected to the respective circuit. The connection scheme is shown on this page. Connect the control lamps as described in Chapter 8.9.



Overall schematic connection diagram

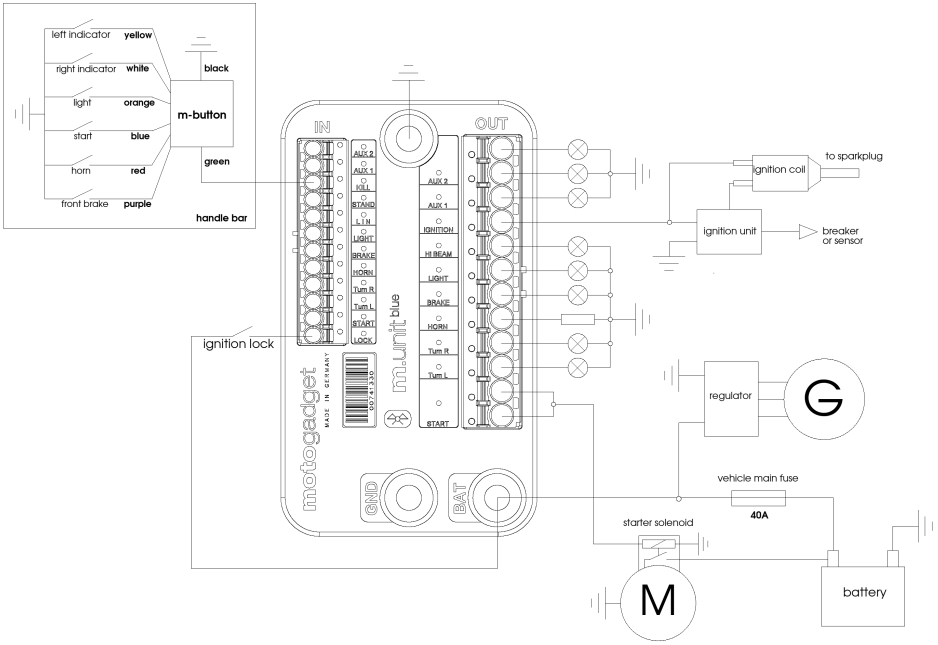
The circuit diagram below shows a simplified vehicle wiring loom



Overall schematic connection diagram with m.button (optional accessory)

The circuit diagram below shows a simplified vehicle wiring loom when using the m.button. In this case, 6 leads are dispensed with because only one cable is needed to connect the handle bar controls with the m-unit.

THE M.BUTTON MUST BE 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 two connection cables with 2.5mm² cross-section to the m.unit's two *START* output terminals.

All starters with separate starter relays (e.g. Japanese models) must continue to be operated using the original starter relay. In this case, the *Start* output 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 the start pushbutton. This second relay can be dispensed with.

***IGNITION* output**

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

***AUX1* output**

All loads, such as the rear light, license plate light, radio, heated grips etc. are powered by this output. In setup menu, Different configurations of this output are possible in the setup menu – depending on the use.

AUX 2 Output

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

Ignition Lock

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

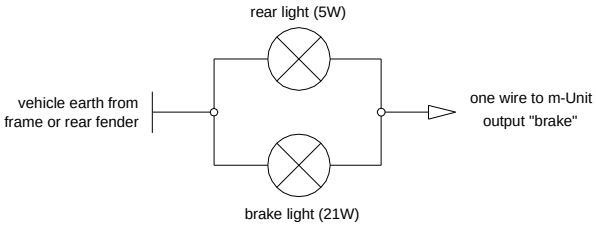
NOTE:
For older Japanese models, resistors can be integrated into the ignition lock (simplified anti-theft protection). When bridging or removing the ignition lock, the ignition system will not generate a spark, before a specific cable, directly routed from the ignition unit to the ignition lock, is 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 is deactivated via a built-in transponder inside the ignition key. In this case, it is not possible to bridge or remove the ignition lock.

According to the German Road Traffic Licensing Regulation (StVZo), the vehicle has to be equipped with a steering lock. If the 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) – this requiring registration in the vehicle documents.

One-wire Rear Light

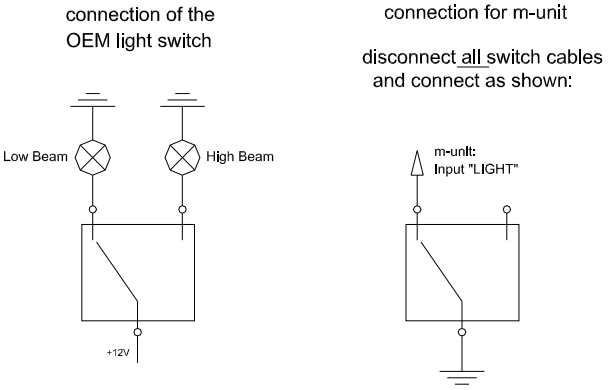
With default wiring, the *BRAKE* output is connected to the brake light, and the rear light to the *AUX1* output.
If you want to connect the rear light and brake light with <u>one</u> common wire, please select the correct setting in the Setup Menu No. 2 (refer to Chapter 9). In this case, rear light and brake light will be switched together in parallel and connected to the common ”Brake” output.



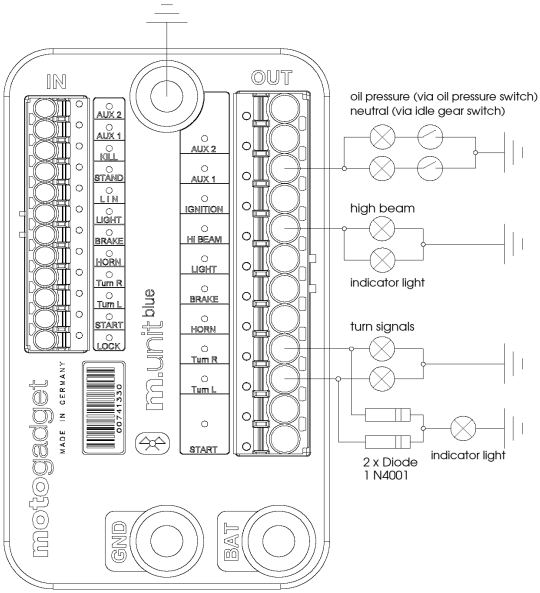
Emergency Brake Light

In this configuration (Menu 4 / Option G), a detected deceleration of more than 8m/s² over a time period in excess of 1 second 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

The 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 pushbuttons)

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 LEDs
C) one-wire rear light / brake light for light bulbs

Menu 3 – Direction Indicator 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-time flashing with 5Hz and continuous light
E) 2-time flashing then 1s continuous light – repeated
F) 3s continuous light, then flashing with 5Hz
G) emergency braking – flashing with 5Hz and hazard lights

Menu 5 – Alarm configuration

A) alarm deactivated
B) silent alarm (alarm events 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 – Direction indicators 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 direction indicators)

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 pushbutton connected to AUX1 input
E) ON / OFF with switch connected to AUX1 input

Menu 10 – AUX2

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

Menu 11 – Side stand

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

Menu 12 – Parking light

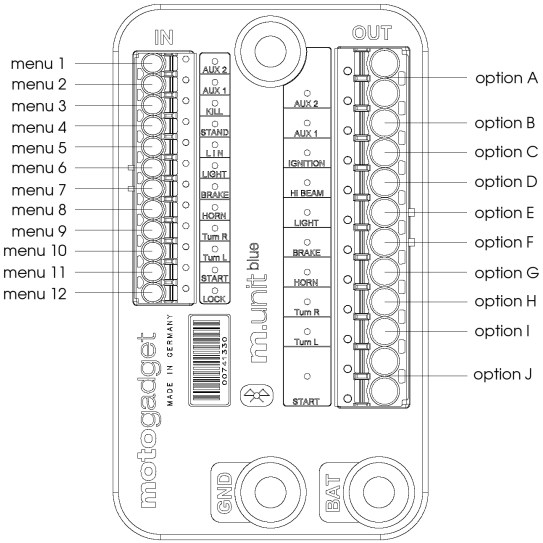
A) not active
B) active
C) 1h active
D) 3h active
E) 6h active

9.2 Starting setup

Put the bike in upright position to its main stand. To start the setup, press the horn pushbutton 3 times briefly immediately after switching on the ignition. A successful setup start is displayed by a brief blinker flashing. If the horn sounds, please press the pushbutton faster.

9.3 Navigation in setup

The LEDs on input side represent the Menus 1 to 12. All LEDs on the output side display the options A to J of the selected menu. The LED flashing sequence displays either the currently active menu item or selectable option. Press the pushbutton briefly to switch to next menu / option. Press the push button for an extended time (2 s) 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 down the horn pushbutton until the device changes back to normal operation mode.

9.4.1 Calibration

When exiting from setup, m.unit calibrates itself so as to be able to detect any defective lamps while operating. For this purpose, the *TurnR, TurnL, Light, Highbeam, Brake* and *AUX1* outputs are successively switched on to measure the individual currents at each output.

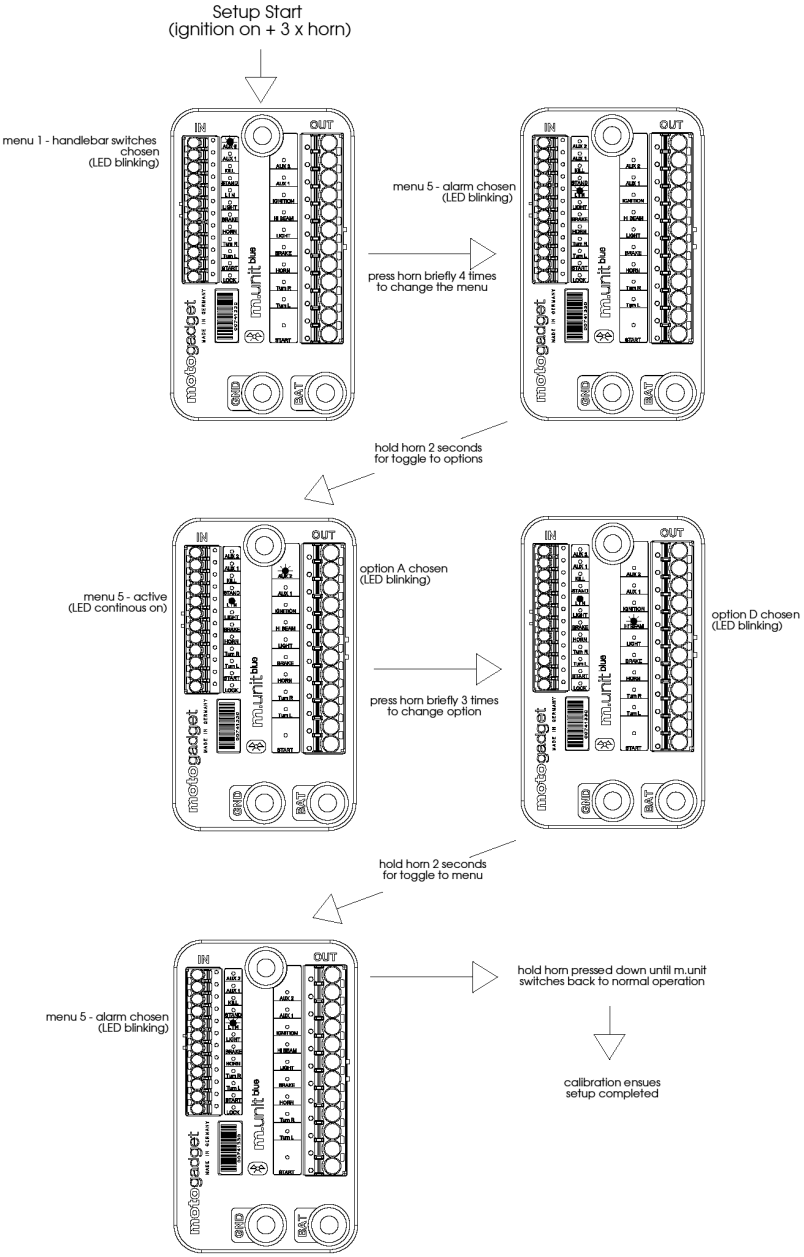
In case of a defective lamp, a message is transmitted to the ***m.ride*** app and, if possible, the change to a different lamp is executed (low beam / high beam, or rear light / brake light, respectively). In case of a defective direction indicator light, the flashing frequency is doubled – in accordance with legal regulations.

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

The m.unit also measures its position during the calibration process, thus the bike need to stand in upright position on the main stand.

9.5 Setup Example

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



10 Pairing m.unit with a smartphone

Install the app ***m.ride*** (Android 6.0 / iOs 10.0 or higher required, restricted compatibility of device manufacturer and model apply). After Installation, select *Hardware* option in ***m.ride*** main menu and follow instructions.

An m.unit can pair with a maximum of 5 handheld Bluetooth devices. Connecting to the 6th device will override the 1st device in memory.

11 Reset

To delete all internal data such as Bluetooth devices, settings and events, start the setup und hold the start-button for 10s. A successful reset will be indicated by a brief flashing of the blinkers. We recommend a reset particularly if the m.unit was purchased in used condition, prior to installation.

12 Troubleshooting

12.1 After installation and on initial start-up

- Ensure that the battery provides a sufficient voltage of 12.4V minimum (ignition OFF).
- Check for the optimal ground connection between mounting bolt of m-unit and negative battery terminal (vehicle earth).
- 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 information in terms of the correct functionality of the input/output. A functional test must always be carried out 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 flashes)	Poor electrical connection between vehicle earth and connector pin of m-unit	Route a separate cable from negative battery terminal to one of the connector pins
	Current flow through starter or original starter relay too high	Use a 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 flashes)	Poor electrical connection between vehicle ground and connector pin	Route a separate cable from negative battery 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 direction indicators are lit / glowing permanently	Position lights are activated	Set Setup Menu Item 6 to Option A

12.2 Return And Complaints

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

http://motogadget.com/en/repairinquiry

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.

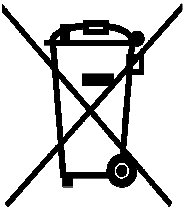
WEEE directive

The wheelie 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 collection 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'appereil.

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