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# REF: Electrical System

## Body Control Modules - Aftermarket

### Motogadget M-Unit Blue

This unit is designed to replace the power control device on your motorcycle. It does not provide engine spark or timing, so you must supply (or keep) that part of the motor control devices (points & mech advance or ignition module & timing sensor, coil, etc). Their main website is <https://motogadget.com>

The m-unit operation (and the manual) is updated regularly so it is important to know which version you have to know what functions are programmable. The manuals are not dated, so pay attention to the version & S/N references.

Take note that most input switch connections are expected to activate the signal by grounding the input. This may not be the way the stock switches are configured.

Document Links:

mo.unit blue / basic - v3.0 -

[https://manuals.motogadget.com/docs/mo.unit/publish/English/Manuals/mo.unit\\_blue\\_manual.pdf](https://manuals.motogadget.com/docs/mo.unit/publish/English/Manuals/mo.unit_blue_manual.pdf)

Older links (may no longer be valid):

[https://motogadget.com/shop/media/downloads/manual/munit\\_blue\\_manual\\_1.8\\_en.pdf](https://motogadget.com/shop/media/downloads/manual/munit_blue_manual_1.8_en.pdf)

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Revival Cycles' has done a number of YouTube videos (called Tech Talk) and has some documentation as well.

<https://technicalarticles.revivalcycles.com/hc/en-us/categories/360000739551-Motogadget>

The Ins and Outs of the Motogadget M-Unit Blue (21:13min)

<https://www.youtube.com/watch?v=899wODtXeRg>

This diagram may or may not be like your setup (may not be helpful):

[https://revivalcycles.zendesk.com/hc/en-us/article\\_attachments/360012382451/universal\\_m-unit\\_blue\\_diagram\\_5.0\\_.pdf](https://revivalcycles.zendesk.com/hc/en-us/article_attachments/360012382451/universal_m-unit_blue_diagram_5.0_.pdf)

Using Your Phone to Connect to the m-unit:

<https://www.mo-ride.de/en/>

## Thunder Heart - EA4250D

This section is related to the Electronic Harness Controller available from Thunder Heart Performance Corp. The information gathered here was due to a significant effort by XLForum member, Roane, while trying to implement the EA4250D on his Ironhead Sportster. <sup>1)</sup>

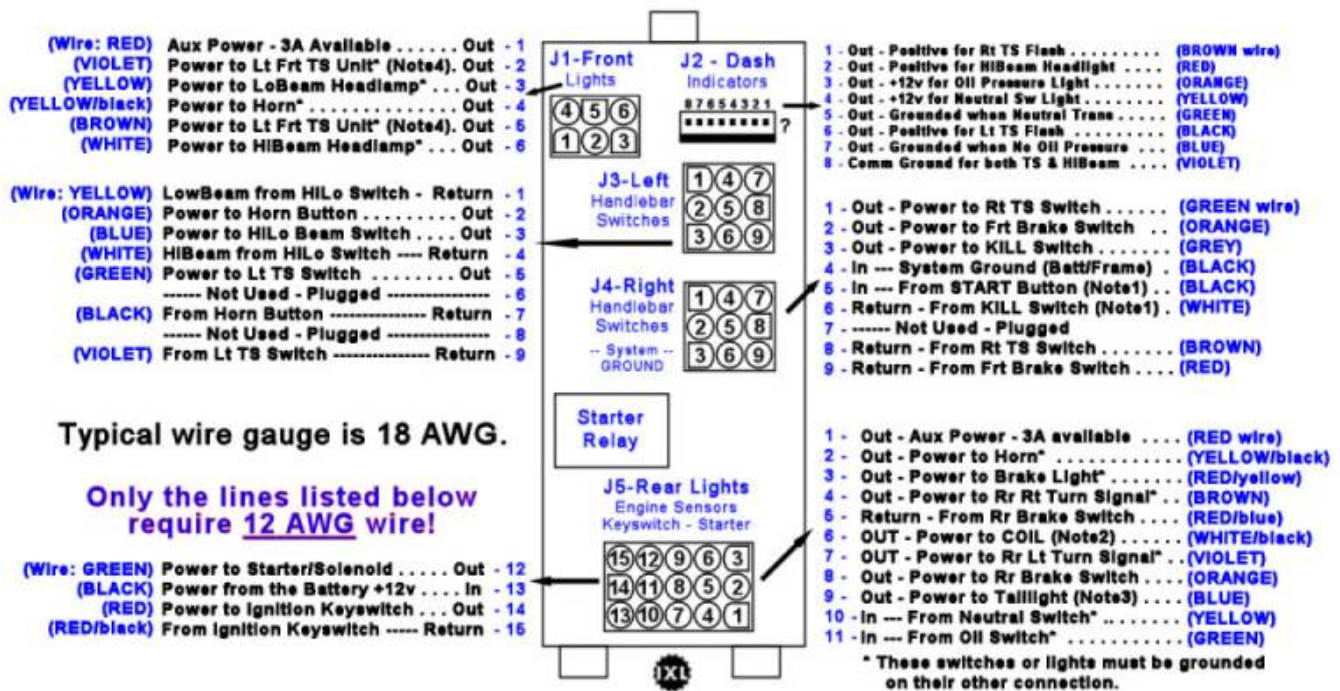
The TH EA4250D controller works in conjunction with whatever spark timing system you have, whether points, Ignition Control Module or later Engine Control Module. In any case, the TH unit does not control the spark creation or timing but rather simply controls the power to the coil (and ignition module) in order to allow or prevent the engine from running.

The installation manual can be downloaded at the Thunder Heart website (<http://thunder-heart.com/Tech%20Service%20PDFs/EI4250.pdf>). It should be consulted carefully in conjunction with the added information below. The manual information is not repeated here.

Here is an overall diagram to detail the connection of various switches, lights, sensors, etc. (click on an image to see a larger version):

## Thunderheart EA4250D Electronic Harness Controller

(Pre-1996 wire colors are used throughout)



Typical wire gauge is 18 AWG.

Only the lines listed below require 12 AWG wire!

Note(1): The KILL Switch may be a momentary, normally-closed, switch or it may be a two position switch providing ON-OFF functions (like a rocker or toggle switch). It gets power from the the TH unit from J4-Pin3 (GREY wire). It MUST provide power to the TH unit on J4-Pin6 (WHITE) when not pressed and prevent power there when it is pressed. (Also see Note(2)) That WHITE wire must also be connected to one side of the START Button.

The START Button (a momentary, normally-open switch) output MUST NOT send power unless it is pressed. When pressed, it returns power to the TH unit at J4-Pin5 (BLACK) to activate the internal STARTER Relay.

When activated, the internal STARTER Relay sends high current power to the Starter/Solenoid using J5-Pin12 (GREEN).

Note(2): Power from the KILL Switch (WHITE wire) comes into the the TH on J4-Pin6 and feeds power to J5-Pin6. The WHITE/black wire of J5-Pin6 then feeds power to the Ignition COIL. But, the coil trigger signal (connected to the other side of the coil) MUST come from the Ignition points or an electronic timing module.

Note(3): The taillight power can be used for a center tail light or for the dim element of Turn Signal units that use an 1157 bulb or can be used to power both center & TS running lights.

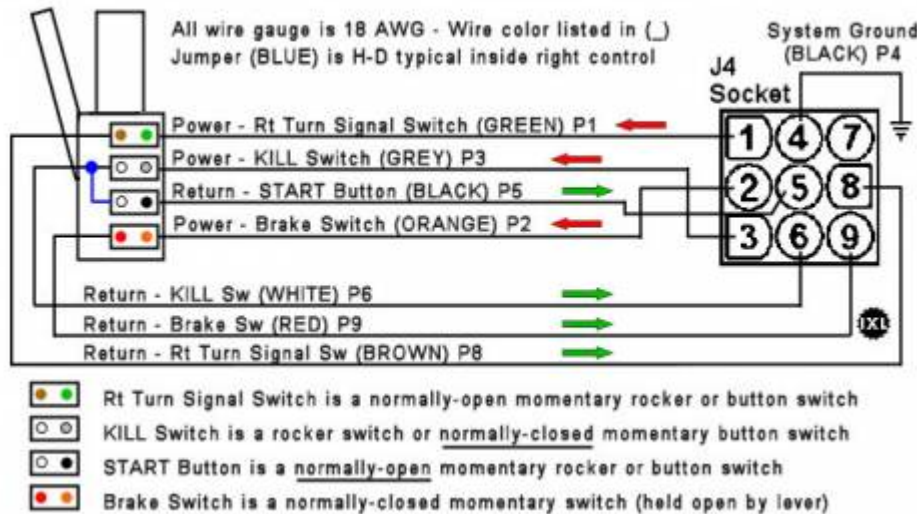
Note(4): If you have dual-element front TS units, you may make them running lights by providing power to the dim element of the 1157 bulbs using the AUX Power from J1-Pin1 or you may run a separate wire to feed power from J5-Pin9.

2)

**Note that the Auxiliary Power Outputs at J1-Pin1 and J5-Pin1 are both keyswitched power. They are ONLY ON when the Keyswitch is ON.**

The following image shows the typical wiring that would be used for the right-hand HD control - Wire colors are for the TH wire harness:

### Thunder Heart EA4250D Controller - Right Hand Control Wiring (Pre-1996 H-D)

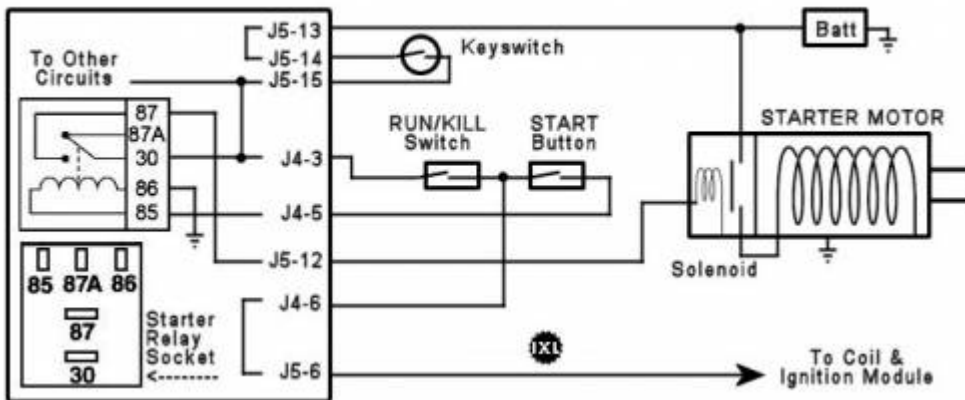


3)

Note that on most Sportsters, all the way up thru 2013, the wiring configuration is functionally the same as above (with only some minor wire color variations - or those noted in the TH Install Manual). The BLUE jumper wire shown in the diagram between the RUN/STOP Switch and the Starter Button is typically internal to the RH Switch Housing.

Below is a diagram of the ignition connections, from the handlebar switches to the Starter Motor. This is intended to explain the operation of the internal Start Relay in relation to the RUN/KILL & START switches. The shown internal connections are functional representations and do not represent that these connections are simply jumper-wired as shown. (This configuration was gleaned from the manual (minimal info) and from continuity testing. It is believed to be accurate, but no guarantee.)

### Thunderheart EA4250D Switches & Ignition Circuit



4)

## Ultima 18-530

This module looks very much like a re-badged version of the ThunderHeart EA4250D.



## CANbus Optional Equipment

### CAN-Switchbox

The CAN-Switchbox is intended to give you the ability to use alternative switches, speedometer &

tachometer on H-D models that use the CANbus. The unit simulates the original functions that were implemented on the Right/Left-Hand Control Modules and also the Speedometer. You are able to use switches and pushbuttons from different supplier.

Can-Switchbox Overview

[https://www.tlt-moto.de/info\\_en.html](https://www.tlt-moto.de/info_en.html)

User Manual (from Ser#500)

[https://www.tlt-moto.de/download/tlt-manual\\_rev-4.2\\_en.pdf](https://www.tlt-moto.de/download/tlt-manual_rev-4.2_en.pdf)

User Manual (from Ser#600)

[https://www.tlt-moto.de/download/tlt-manual\\_rev-4.9\\_en.pdf](https://www.tlt-moto.de/download/tlt-manual_rev-4.9_en.pdf)

User Manual (from Ser#900)

[https://www.tlt-moto.de/download/tlt-manual\\_rev-6.0\\_en.pdf](https://www.tlt-moto.de/download/tlt-manual_rev-6.0_en.pdf)

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1)

See this XLFForum thread: <http://xlforum.net/forums/showthread.php?t=2075235>

2) , 3) , 4)

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