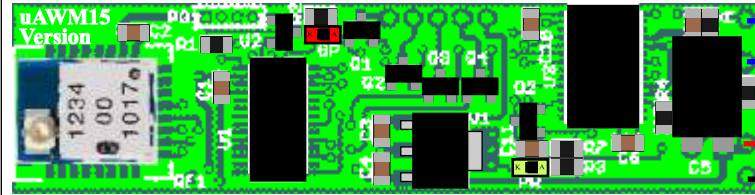


There are many battery options from which to select. This is just one example. Whatever battery you select, be sure it fits the space available. Measure and then make a balsa wood model of the battery to verify fit before purchasing. Battery capacity is your run time. Capacity is related to battery size. Large battery size equals longer run time.

C15X with 3.7V Battery Plus Boost Circuit Hookup Works With 3rd Party NMRA-DCC Decoders

C15X shown without the snap-on whip antenna



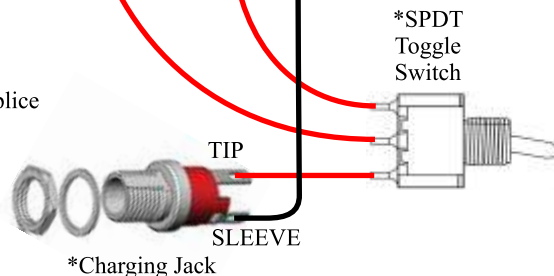
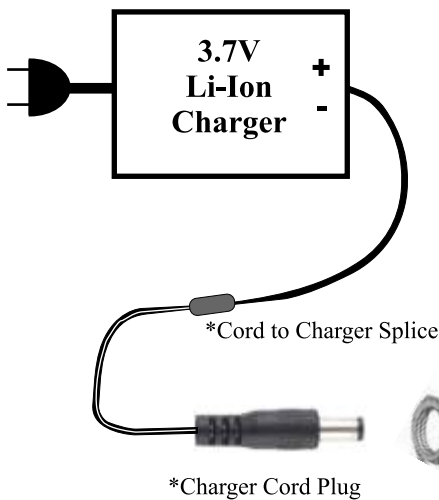
To
DCC
Decoder

Warning
Do Not Accidentally
Reverse Polarity



Recommended method to solder wire to C15 pads

*3.7V Li-Ion Rechargeable Battery With Protection



Charge
Run

Any type of switch can be used. The listed switch is a relatively small one at a reasonable price. Smaller ones are available. The switch and jack allow the battery to be charged while inside the car or loco.

* Part Numbers and sources are on page 2

- Take care not to damage the C15's small solder pads.
- Do not reverse polarity or the C15 will be damaged and may not be repairable.
- Do not try to put wire into solder pad holes. Instead lay the wire on top of the pad and solder.
- Use small diameter wire. Recommended size is #24 to #28 AWG. The low currents of HO equipment allow for the small size wire.
- Stranded wire is more flexible but solid can be used as well
- Use only one type of charging jack and cord. Life is so much simpler when the same connector is used on all your trains.

Remington Industries offers a wire hookup kit consisting of small 25' reels of of different colors and can be purchased as either stranded or solid. It comes in a handy cardboard box designed as a wire dispenser. We purchase a box of both solid and stranded, #26 AWG. The box costs about \$16 and is well worth it. The kit can be ordered directly from their website.

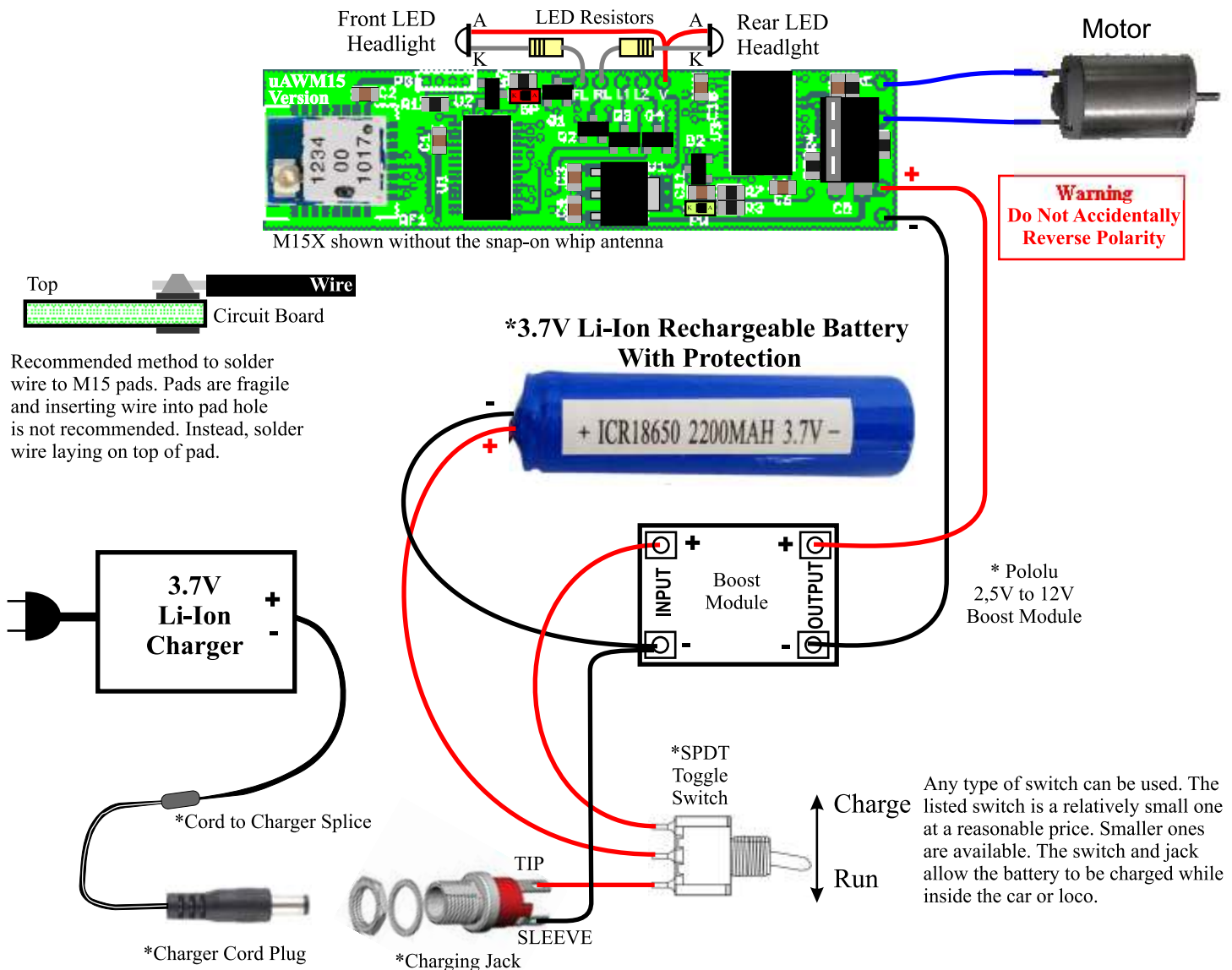
<https://www.remingtonindustries.com>

Search for item: 26UL1007STRKIT



M15X with 3.7V Battery Plus Boost Circuit

M15 has the same power connections as the C15. However, despite their similar appearances, the M15 is a complete motor driver decoder. No 3rd party decoder is required. The M15 has the AirWire receiver, a full featured 1.5A motor driver and 4 light drivers for headlights and other uses. To see all of the features of the M15, please download the M15 User Guide from the CVPUSA website.



- Take care not to damage the M15's small solder pads.
- Do not reverse polarity or the M15 will be damaged and may not be repairable.
- Do not try to put wire into solder pad holes. Instead lay the wire on top of the pad and solder.
- Use small diameter wire. Recommended size is #24 to #28 AWG. The low currents of HO equipment allow for the small size wire.
- Stranded wire is more flexible but solid can be used as well
- Use only one type of charging jack and cord. Life is so much simpler when the same connector is used on all your trains.

11.1V LiPo Batteries Without Built-In Protection

No Boost Module Needed

| Evaluated | 11.1V LiPO Batteries without built-in protection | | | | | | As Of Jan 2020 | | | mm (METRIC) | | | INCHES | | | | | |
|--|---|--------------|----------|---|----------------|---------|--|------|------|-------------|-----|-----|--------|------|------|-----|-----|-----|
| Source | Model Name | Stock # | Volts | mAh | Connector | Price | L | W | H | L | W | H | | | | | | |
| Amazon | Turnigy 3S 25~40C Lipo Pack | none | 11.1V | 370 | JST-XH | \$6.77 | 60 | 31 | 13 | 2.4 | 1.2 | 0.5 | | | | | | |
| Amazon | Onyx 11.1V LiPo: Micro Plug | ONXP1747 | 11.1V | 600 | micro | \$12.99 | 52 | 32 | 21 | 2.0 | 1.3 | 0.8 | | | | | | |
| Amazon | Gens Ace LiPo Battery JST Plug | EFLB8003SJ30 | 11.1V | 800 | JST | \$18.03 | 52 | 30 | 23 | 2.0 | 1.2 | 0.9 | | | | | | |
| Amazon | Lancer 11.1v 900mAh LiPO Stick Will not fit narrow hood GP loco | none | 11.1V | 900 | Tamiya | \$24.90 | 63.5 | 24.5 | 19 | 2.5 | 1.0 | 0.7 | | | | | | |
| EVIKE | Matrix 11.1V Stick | 78858 | 11.1V | 1000 | BMS / XH 3-Pin | \$24 | 85 | 14 | 15.5 | 3.3 | 0.6 | 0.6 | | | | | | |
| Amazon | FCONEGY 3S 11.1V 1200mAh | none | 11.1V | 1200 | Tamiya | \$16.99 | 129 | 21 | 17.5 | 5.1 | 0.8 | 0.7 | | | | | | |
| Amazon | Tattu 11.1V 1200maH Stick 3S Fits boxcar but wires against car end | none | 11.1V | 1200 | Tamiya | \$17.99 | 124 | 20 | 16 | 4.9 | 0.8 | 0.6 | | | | | | |
| Amazon | UKARMS AC-221C PEQ Brick | none | 11.1V | 1200 | Deans | \$29.95 | 63.5 | 25.4 | 19 | 2.5 | 1.0 | 0.7 | | | | | | |
| EVIKE | Matrix 11.1V Stick | 88611 | 11.1V | 1450 | BMS / XH 3-Pin | \$25 | 116 | 21 | 16.5 | 4.6 | 0.8 | 0.6 | | | | | | |
| Amazon | Turnigy 1800mAh 3S | none | 11.1V | 1800 | XT60 | \$13.04 | 104 | 34 | 23 | 4.1 | 1.3 | 0.9 | | | | | | |
| Amazon | Zeee 2200mAh 11.1V 35C 3S | | 11.1V | 2200 | Deans and XT60 | \$32.99 | 102 | 34 | 23 | 4.0 | 1.3 | 0.9 | | | | | | |
| The loco and car measurements are approximate. You must measure your unit to insure battery fit. Battery dimensions are from manufacturer's datasheet. Actual size will be slightly different. | | | | | | | HO dummy A Loco at the rear old behind cab to rear | | | | | | 127.0 | 28.0 | 25.4 | 5.0 | 1.1 | 1.0 |
| | | | | | | | HO Long Grain Hopper | | | | | | 152.4 | 30.5 | 25.4 | 6.0 | 1.2 | 1.0 |
| | | | | | | | HO Athearn 40' box car Interior | | | | | | 140.0 | 31.8 | 30.5 | 5.5 | 1.3 | 1.2 |
| | | | | | | | HO Dummy Narrow Hood SD7 behind cab to rear | | | | | | 127.0 | 17.8 | 27.9 | 5.0 | 0.7 | 1.1 |
| Tenergy | TN267 1-4 Cells Li-Po/Li-Fe Balance Charger | \$24 | | | | | Yellow fill indicates fit could be an issue depending on how the battery | | | | | | | | | | | |
| Source Websites | | | | | | | | | | | | | | | | | | |
| EVIKE | https://www.evike.com | | AMAZON | https://amazon.com | | | | | | | | | | | | | | |
| MAXAMPS | https://www.maxamps.com/ | | ADAFRUIT | https://www.adafruit.com/ | | | | | | | | | | | | | | |
| TATTU | https://www.genstattu.com/ | | Tenergy | https://power.tenergy.com | | | | | | | | | | | | | | |

3.7V Lithium-Ion Batteries

Boost Module Required

| Evaluated | 3.7V Lithium-Ion Flat Packs with Built-in Protection Boost Module Required | | | | | | | mm (Metric) | | | Inch | | |
|---|---|--|-------------|-------|------|-----------|-------|-------------|------|------|------|-----|-----|
| Source | Model Name | Stock # | Type | Volts | mAh | Connector | Price | L | W | H | L | W | H |
| Adafruit | 3.7V 350mAh | ID: 2750 | Flat | 3.7 | 350 | JST-2.0 | 6.95 | 29 | 36 | 4.8 | 1.1 | 1.4 | 0.2 |
| Adafruit | 3.7V 400mAh | ID: 3898 | Flat | 3.7 | 400 | JST-2.0 | 6.95 | 62 | 34 | 5.0 | 2.4 | 1.3 | 0.2 |
| Adafruit | 3.7V 500mAh | ID: 1578 | Flat | 3.7 | 500 | JST-2.0 | 7.95 | 29 | 36 | 4.8 | 1.1 | 1.4 | 0.2 |
| Adafruit | 3.7V 1200mAh | ID: 258 | Flat | 3.7 | 1200 | JST-2.0 | 9.95 | 34 | 62 | 5.0 | 1.3 | 2.4 | 0.2 |
| Adafruit | 3.7V 2000mAh | ID: 2011 | Flat | 3.7 | 2000 | JST-2.0 | 12.5 | 60 | 38 | 7.0 | 2.4 | 1.5 | 0.3 |
| Adafruit | 3.7V 2500mAh | ID: 328 | Flat | 3.7 | 2500 | JST-2.0 | 14.95 | 47 | 61 | 6.7 | 1.9 | 2.4 | 0.3 |
| Adafruit | Lithium Ion Clylndrical 3.7V 2200mAh | ID: 1781 | Cylindrical | 3.7 | 2200 | JST-2.0 | 9.95 | 69 | 18 | 18 | 2.7 | 0.7 | 0.7 |
| Tenergy | Li-ion 18650 3.6V 2200mAh with / PCB | 30011-02 | Cylindrical | 3.7 | 2600 | Bare Wire | 8.99 | 69 | 19 | 19 | 2.7 | 0.7 | 0.7 |
| The loco and car measurements are approximate. You must measure your unit to insure battery fit. Battery dimensions are from manufacturer's datasheet. Actual unit may be slightly different. | | HO dummy A Loco at thearn old behind cab to rear | | | | | | 127.0 | 28.0 | 25.4 | 5.0 | 1.1 | 1.0 |
| | | HO Long Grain Hopper | | | | | | 152.4 | 30.5 | 25.4 | 6.0 | 1.2 | 1.0 |
| | | HO Athearn 40' box car Interior | | | | | | 140.0 | 31.8 | 30.5 | 5.5 | 1.3 | 1.2 |
| | | HO Dummy Narrow Hood SD7 behind cab to rear | | | | | | 127.0 | 17.8 | 27.9 | 5.0 | 0.7 | 1.1 |

Battery Charger

| | |
|---------|---|
| Tenergy | TLP-4000 Universal 1A Smart Charger (switch select 3.7, 7.4, 11.1, 14.8V) |
|---------|---|

Boost Module

| | | |
|--------|--|--------|
| Pololu | 2.5V to 12V Step-Up Voltage Regulator U3V12F12 | \$3.95 |
|--------|--|--------|

Threaded Jack for Battery Charger and Matching Cord

| | | | |
|--------|--------------------------------------|------------------|------------|
| Mouser | DC Power Cords 2.1MM 24" R/A Plug | Cat #: 172-4207 | \$3.65 |
| Mouser | DC Power Jack Panel Mnt 2.1mm Long B | Cat #: 502-L721A | \$4.72 (1) |

Toggle Switch SPDT

| | | | |
|--------|------------------------------------|----------------------------|--------|
| Mouser | Toggle Switches SWITCH TOGGLE SPDT | Cat #: 108-1MS1T2B3M1QE-EV | \$2.36 |
|--------|------------------------------------|----------------------------|--------|

Online Ordering Company Websites

| | |
|----------|---|
| Adafruit | https://www.adafruit.com/category/889 |
| Tenergy | https://power.tenergy.com/ |
| Amazon | https://amazon.com |

| | |
|--------|---|
| Mouser | https://mouser.com |
| Pololu | https://www.pololu.com/product/2117 |

See our companion appnote Batteries For HO Locomotive Operation

It contains detailed information about different types of rechargeable batteries, part numbers and sources plus, boost modules and locomotive run time charts.