

# Electrical Fuse Schedule (Implementation - Lynx Topology)

As-of date: 2026-02-12

Purpose: define each required fuse by circuit, protected conductor/device, holder/housing method, physical placement, and linked wire gauge assumptions for the approved Phase 1 Lynx architecture.

Related docs:

- Canonical electrical/system baseline: [docs/SYSTEMS.md](#)
- Implementation topology and conductor map: [docs/ELECTRICAL\\_overview\\_diagram.md](#)
- Decisions/open items tracker: [docs/TRACKING.md](#)
- BOM source of truth: [bom/bom\\_estimated\\_items.csv](#)

## Sweep Findings (2026-02-12)

| Finding ID | Finding  | Impact   | Resolution status   |
|------------|--|--|---|
| FS-001     | BB1248120 was modeled in planning docs as 120A on the 48v output.                                    | Alternator-recovery math was materially overstated.            | Corrected in <a href="#">bom/bom_estimated_items.csv</a> row 18 and <a href="#">docs/SYSTEMS.md</a> (~1500W, about 26A at 57.6V). |
| FS-002     | Fuse schedule listed fuse values but not a complete housing/holder definition for every fuse family. | Install path and procurement freeze were ambiguous.            | Resolved below with explicit holder/housing method and location per fuse ID.  |
| FS-003     | Fuse schedule did not tie each fuse to a conductor gauge plan.                                       | Hard to verify "fuse protects conductor" rule at install time. | Resolved below with gauge mapping and assumptions.  |

## Design Basis

- Topology: Victron Lynx Distributor M10 ( LYN060102010 ) with 4 fused 48V branches.
- Battery bank assumption: 2x 48V 100Ah batteries in parallel ( 2 separate battery-positive conductors leaving batteries).
- Branch devices on Lynx:
  1. MultiPlus-II 48/3000
  2. SmartSolar 150/45
  3. Sterling BB1248120 output
  4. Orion-Tr 48/12-30 input
- SmartShunt control/power lead note: retain the Victron-supplied fused positive sense/power lead assembly (small-current harness), and avoid substituting lower-voltage automotive fuse components on the 48V system.
- Sterling rating basis used for this revision: BB1248120 output ceiling about 1500W (~26A at 57.6V), with 150A input fuse and 40A output fuse guidance.

## Manufacturer References Used

- Victron MultiPlus-II 120V installation page (recommends 125A DC fuse for 48/3000; cable table includes AWG 1 to AWG 2/0 by length): [https://www.victronenergy.com/media/pg/MultiPlus-II\\_120V/en/installation.html](https://www.victronenergy.com/media/pg/MultiPlus-II_120V/en/installation.html)
- Victron SmartSolar MPPT 150/45 installation/spec pages ( 50A-63A battery fuse range, terminal limit 16 mm2 / AWG 6 ): [https://www.victronenergy.com/media/pg/Manual\\_SmartSolar\\_MPPT\\_150-35\\_150-45/en/installation.html](https://www.victronenergy.com/media/pg/Manual_SmartSolar_MPPT_150-35_150-45/en/installation.html) and [https://www.victronenergy.com/media/pg/Manual\\_SmartSolar\\_MPPT\\_150-35\\_150-45/en/technical-specifications.html](https://www.victronenergy.com/media/pg/Manual_SmartSolar_MPPT_150-35_150-45/en/technical-specifications.html)
- Victron Orion-Tr Smart (isolated) installation page ( 48V side fuse 20A ; 12V side fuse 60A ; cable table): [https://www.victronenergy.com/media/pg/Orion-Tr\\_Smart\\_DC-DC\\_Charger\\_\(isolated\)/en/installation.html](https://www.victronenergy.com/media/pg/Orion-Tr_Smart_DC-DC_Charger_(isolated)/en/installation.html)
- Victron Lynx Distributor manual (MEGA fuse carrier format): [https://www.victronenergy.com/media/pg/Lynx\\_Distributor/en/installation.html](https://www.victronenergy.com/media/pg/Lynx_Distributor/en/installation.html)
- Victron fuse datasheet (for 48V systems use 58V -class fuses): <https://www.victronenergy.com/upload/documents/Datasheet-Fuses-EN.pdf>
- Sterling BB12V->48V charger references (model list includes BB1248120, fuse/cable guidance): <https://sterling-power.com/products/battery-to-battery-chargers-12v-to-48v>
- Blue Sea Systems guidance (fuse close to source): <https://www.bluesea.com/resources/1437>

## Required Fuse Map (Start-to-Finish, With Housing)

| Fuse ID   | Circuit (source -> load)                              | Protected wire/device   | Fuse type and voltage class              | Amperage                                      | Holder or housing method  | Physical location   | Planned conductor gauge                             |
|-----------|---|---|--|---|---|---|---|
| F-01A     | Battery A + -> bank positive combine/disconnect input | Battery A positive cable leaving battery                      | Class T (>=125VDC)                       | 225A  | Blue Sea Class T fuse block (covered stud mount)                    | Battery compartment, within ~7" of Battery A positive post    | 2/0 AWG   |
| F-01B     | Battery B + -> bank positive combine/disconnect input | Battery B positive cable leaving battery                      | Class T (>=125VDC)                       | 225A  | Blue Sea Class T fuse block (covered stud mount)                    | Battery compartment, within ~7" of Battery B positive post    | 2/0 AWG   |
| F-02      | Lynx Slot 1 -> MultiPlus DC+                          | Main inverter positive feeder                                 | MEGA, 58V or 80V                         | 125A  | Integrated Lynx Distributor fuse slot                               | Lynx Distributor, Slot 1                                      | 2/0 AWG planned (AWG 1 minimum on short run)        |
| F-03      | Lynx Slot 2 -> SmartSolar BAT+                        | MPPT battery-side positive feeder                             | MEGA, 58V or 80V                         | 60A   | Integrated Lynx Distributor fuse slot                               | Lynx Distributor, Slot 2                                      | 6 AWG   |
| F-04      | Lynx Slot 3 -> Sterling BB1248120 output +            | Sterling output feeder to house 48v bus                       | MEGA, 58V or 80V                         | 40A   | Integrated Lynx Distributor fuse slot                               | Lynx Distributor, Slot 3                                      | 6 AWG planned (10 AWG minimum per Sterling table)   |
| F-05      | Lynx Slot 4 -> 48V auxiliary feeder (Orion branch)    | Aux feeder from Lynx to Orion-branch fuse point               | MEGA, 58V or 80V                         | 40A   | Integrated Lynx Distributor fuse slot                               | Lynx Distributor, Slot 4                                      | 6 AWG   |
| F-06      | 48v aux feeder -> Orion 48v input +                   | Orion input lead (device protection)                          | Inline MIDI/AMI/ANL family rated >=58VDC | 20A target (23A if using Victron MIDI family) | Sealed inline fuse holder mounted on backplate                      | Electrical cabinet, mounted at source end of Orion input lead | 6 AWG planned (8 AWG minimum per Orion cable table) |
| F-07      | Orion 12v output + -> 12v fuse panel feed             | Main 12v feeder from Orion                                    | Inline MIDI/AMI/ANL family rated >=32VDC | 60A   | Sealed inline fuse holder mounted on backplate                      | Electrical cabinet, within ~7" of Orion 12V output stud       | 6 AWG planned (8 AWG minimum per Orion cable table) |
| F-08      | Starter battery + -> Sterling BB1248120 input +       | Vehicle-side charger input cable                              | MEGA/ANL equivalent rated >=32VDC        | 150A  | Sealed engine-bay fuse holder with high-temp cover                  | Engine bay, within ~7" of starter battery positive post       | 2/0 AWG planned (2 AWG minimum per Sterling table)  |
| F-09A/B/C | PV string + leads -> MPPT PV combiner                 | Each solar string positive conductor and reverse-current path | gPV string fuse (>=150VDC)               | 15A each (provisional)                        | 10x38 touch-safe PV fuse holders in weatherproof combiner enclosure | Roof-entry combiner near gland/pass-through                   | 10 AWG PV wire                                      |

|           |   |  |   |  |   |   |                          |
|-----------|---|--|---|--|---|---|--------------------------|
| F-10      | 12v fuse panel branch circuits -> each 12v load           | Individual 12v branch conductors and load circuits | ATO/ATC blade fuses (32v class)                       | Per-circuit                            | Integrated sockets in Blue Sea 5026/5032 style fuse block | 12v fuse panel in electrical cabinet      | Per branch (table below) |
| OEM-SHUNT | Lynx positive tap -> SmartShunt positive sense/power lead | SmartShunt electronics lead                        | Victron OEM inline low-current fuse (factory harness) | OEM value (small-current harness fuse) | Integrated inline holder in supplied harness              | Electrical cabinet near Lynx positive tap | OEM harness lead         |

## 12V Branch Fuse + Gauge Assignments (Initial Build)

| Circuit | Planned load                                | Fuse         | Planned wire gauge | Notes   |
|---------|---|--------------|--------------------|---|
| 12V-01  | Starlink DC power supply                    | 10A          | 14 AWG duplex      | Remote-work load path   |
| 12V-02  | Fridge (35-50qt)                            | 15A          | 14 AWG duplex      | Move to 12 AWG if one-way run exceeds ~`15 ft`  |
| 12V-03  | Diesel heater electrical                    | 15A          | 14 AWG duplex      | Startup surge expected  |
| 12V-04  | Water pump                                  | 10A          | 14 AWG duplex      | Intermittent duty   |
| 12V-05  | CO + propane detector                       | 3A           | 18/2               | Always-on safety load   |
| 12V-06  | LED strips                                  | 5A           | 18/2               | Lighting branch   |
| 12V-07  | Cerbo GX power feed (assumed via 12v panel) | 3A           | 18/2               | Assumption until final harness lock   |
| 12V-08  | USB-C PD branch (office zone, 2 outlets)    | 10A baseline | 14 AWG duplex      | DC-fed USB charging to reduce inverter idle/conversion overhead; zone budget target ~100-120W |
| 12V-09  | USB-C PD branch (galley zone, 2 outlets)    | 10A baseline | 14 AWG duplex      | DC-fed USB charging path for kitchen/workflow devices; zone budget target ~100-120W           |

## Holder Ecosystem Standard (Procurement Guidance)

| Fuse family                                | Preferred holder style                                  | Why  |
|--|---|--|
| Class T                                    | Covered stud-mounted marine block                       | High interrupt capacity and robust battery-compartment mounting              |
| MEGA (58v/80v) in Lynx                     | Lynx integrated holders only                            | Eliminates separate branch fuse block and keeps topology locked              |
| Inline 48v Orion input (F-06)              | Sealed MIDI/AMI-compatible holder on interior backplate | Keeps source-end protection near branch takeoff                              |
| Inline 12v Orion output (F-07)             | Sealed MIDI/AMI-compatible holder at Orion output       | Protects full panel feeder length  |
| Engine-bay Sterling input (F-08)           | Sealed MEGA/ANL holder, high-temp/engine-bay suitable   | Environmental robustness and source-proximate protection                     |
| PV string fuses (F-09)                     | DIN-rail 10x38 gPV holders in weatherproof combiner     | Proper PV-voltage insulation and serviceable string isolation                |
| 12V branches (F-10)                        | Integrated blade sockets in marine fuse block           | Fast field service and clear branch labeling                                 |
| SmartShunt positive lead (factory harness) | Keep Victron-supplied inline fused lead assembly        | Preserves vendor-qualified low-current protection path for shunt electronics |

## Spare Fuse Inventory

| Fuse type                                | Installed qty | Spare qty to carry | Notes   |
|--|---------------|--------------------|---|
| Class T 225A                             | 2             | 2                  | One spare per installed battery fuse  |
| MEGA 125A (58V/80V)                      | 1             | 2                  | MultiPlus branch  |
| MEGA 60A (58V/80V)                       | 1             | 2                  | MPPT branch   |
| MEGA 40A (58V/80V)                       | 2             | 3                  | Sterling + Orion feeder branches  |
| Orion input fuse (20A target / 23A MIDI) | 1             | 2                  | Match installed holder family   |
| Orion output fuse 60A (32V+)             | 1             | 2                  | Main 12v feeder protection  |
| Sterling input fuse 150A (32V+)          | 1             | 1                  | Vehicle-side charger input  |
| PV string fuse 15A gPV                   | 3             | 3                  | One spare per string  |
| SmartShunt OEM harness fuse              | 1             | 1                  | Keep OEM-equivalent spare if the fuse is field-replaceable on final harness |
| ATO/ATC branch fuses                     | variable      | 2 each used value  | Keep mixed kit onboard  |

## BOM Row Mapping

| Fuse scope   | BOM row(s)  |
|--|---|
| Main battery Class T protection (F-01A/F-01B) + Class T spares   | bom/bom_estimated_items.csv row 7                                 |
| Lynx branch MEGA fuses installed (F-02 to F-05)                  | bom/bom_estimated_items.csv row 10                                |
| Inline Orion/Sterling installed fuse hardware (F-06, F-07, F-08) | bom/bom_estimated_items.csv row 11                                |
| 12V branch panel and blade fuses (F-10)                          | bom/bom_estimated_items.csv row 16                                |
| SmartShunt OEM fused lead (OEM-SHUNT)                            | bom/bom_estimated_items.csv row 23 (included with SmartShunt kit) |
| High-current spare fuse kit (MEGA/MIDI/150A)                     | bom/bom_estimated_items.csv row 105                               |
| PV string fuses + holder (F-09A/B/C) and spares                  | bom/bom_estimated_items.csv row 106                               |

## Assumptions and Open Items

1. Wire sizing above assumes copper conductors, enclosed vehicle routing, and one-way run lengths generally  $\leq 10 \text{ ft}$  for branch circuits unless noted.
2. F-09A/B/C remains provisional at 15A pending final solar module datasheet max-series-fuse confirmation.
3. Final SKU lock is still required for inline holders used by F-06, F-07, and F-08.
4. If Orion run lengths exceed the short/medium assumption, keep F-06 / F-07 and upsize conductors before energizing.
5. Do not use 32V automotive MEGA fuses on 48V house circuits; use 58V / 80V DC-rated fuses only.
6. Keep the SmartShunt fused lead as an OEM harness item unless an equivalent voltage-rated replacement is fully validated.