Solutions Siding

LCC Fusion Project

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Half-Siding Planning Guide

Introduction

This guide defines the **minimum LCC Fusion hardware** required to implement a simple half-siding within a single Pod.
It is intended as a **planning reference**, not an installation or configuration guide.

The half-siding example represents a common real-world scenario: - A turnout branching from a mainline - A siding track protected by signals - Occupancy detection used to influence signaling and turnout behavior

This guide focuses on **what hardware is required**, **where it is physically placed**, and **how capacity is planned**.

> This example assumes familiarity with earlier planning guides and focuses on applying those concepts to a concrete layout scenario.

Example Scope

The half-siding includes:

- One turnout controlling access to a siding
- Signals governing movement into and through the siding
- Occupancy detection for mainline and siding blocks
- All components contained within a single LCC Fusion pod

No node-to-node networking is assumed.

Hardware Planning Summary

LCC Fusion Hardware	Quantity	Purpose
Node Card	1	Hosts firmware, logic execution, and LCC event handling for the half-siding
Node Bus Hub	1	Interconnects all cards in the pod and distributes power and communication
Turnout Card	1	Controls the turnout motor and reports turnout position
Turnout Breakout Board	1	Connects the Turnout Card to the physical turnout machine
PWM Card	1	Drives signal LEDs with controlled brightness and aspect control
Signal Breakout Board	1	Connects signal heads to PWM outputs
BOD Card	1	Detects block occupancy for the siding and mainline
Block Breakout Board	1	Interfaces between track wiring and the BOD Card inputs

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Hardware Placement Strategy

Centralized Pod Components

The following components are typically **centralized** in one physical location, such as under the layout or inside a control enclosure:

- Node Card
- Node Bus Hub
- Turnout Card
- PWM Card
- BOD Card

These cards: - Share power and communication via the Node Bus - Benefit from short, clean interconnections - Are easier to service and expand when grouped together

This centralized arrangement forms the **pod core**.

Distributed Breakout Boards

Breakout boards are placed **near the physical devices they serve**:

- Turnout Breakout Board near the turnout machine
- Signal Breakout Board near the signal mast(s)
- Block Breakout Board near track feeder connections

This placement: - Minimizes long runs of device wiring - Keeps high-current or layout-voltage wiring off the pod - Simplifies troubleshooting and future changes

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Block Planning Example

A typical half-siding may be divided into the following occupancy blocks:

- **2 blocks before the turnout** (approach / mainline)
- **1 block through the turnout**
- **1 block in the siding**
- **2 blocks after the turnout** (departure / continuation)

This results in **6 blocks total**, well within the capacity of a single BOD Card.

> A single BOD Card supports up to **8 blocks**, allowing headroom for expansion or refinement.

Signal and Lamp Planning Example

Signal planning directly affects PWM and Signal Breakout Board requirements.

Example signal usage for a half-siding:

- **Approach signal (mainline)** – 3 lamps

- **Turnout-protecting signal** – 3 lamps

- **Siding exit or clearance signal** – 2 lamps

- **Optional downstream signal(s)** – 2 lamps each

This example might include: - **5 × 3-lamp signals** - **8 × 2-lamp signals**

A single Signal Breakout Board supports up to: - **16 individual lamps** - Or combinations such as: - Five 3-lamp signals (15 lamps total) - Eight 2-lamp signals (16 lamps total)

Proper lamp counting during planning ensures: - Correct selection of PWM Cards - Correct number of Signal Breakout Boards - No redesign later due to capacity limits

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Power Planning Overview

Pod Power Distribution

- All LCC Fusion cards within the pod receive power via the **Node Bus Hub**
- Power and communication are distributed using **standard network cables**
- No point-to-point power wiring is required between cards

This keeps the pod compact and modular.

Layout Accessory Bus

Breakout boards connect to the **layout accessory bus**, not the Node Bus.

Typical uses include: - Turnout motor power - Signal LED power - Track connections for occupancy detection

This separation ensures: - High-current or layout-voltage wiring stays off the pod - Logic electronics remain isolated - Cleaner wiring and safer expansion

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Planning Notes

When planning a half-siding, consider:

- How many blocks are truly needed versus desired
- Whether signals protect individual blocks or grouped movements
- The number of lamps per signal mast
- Future expansion beyond the initial siding

These decisions influence **capacity planning**, not basic hardware selection.

Why This Example Matters

This half-siding example serves as:

- The first **multi-card planning reference** in the LCC Fusion documentation
- A realistic, compact operating scenario
- A reusable planning pattern for other scenes
- A bridge between dioramas and full layout planning

References

- Planner's Guides
- Getting Started
- Node Power Planning Guide
- Multi-Node Planning Guide
- Wired Node-to-Node Planning Guide
- Wireless Node-to-Node Planning Guide
- Node Clusters
- Node Bus Hub Installation Guide
- Configurator's Guides
- CDI Configuration Tool Installation Guide
- **Educational Media**

  – Understanding LCC Fusion – A Clear On-Ramp into LCC-Based Layout Automation – LCC Fusion Podcast – Fusion Hardware Architecture Overview – LCC Fusion Podcast – Cards & Node Basics