IOWA SCALED ENGINEERING

Interlocking-In-A-Box

Features

- Fully automatic interlocking with built-in signal logic
- Ability to simulate trains on any track based on fast time
- Configurable time lock and timeout delays to suit any application
- Supports up to one siding on each of the main lines with appropriate signal indications
- Interfaces with current-based or infrared block detectors (sold separately)
- Simulated trains can trigger 3rd party sound modules for enhanced realism
- Optional automatic interchange can be triggered by simulated trains
- Simple configuration with the MRGUI application

Description

The Iowa Scaled Engineering Interlocking-In-A-Box (MRB-IIAB) provides the signal logic to control a fully automatic interlocking on a model railroad. It can be used to manage a crossing of two active main lines with complete signal systems on both, or more typically, it can be used to manage the crossing of an active (modeled) main line and an inactive (dummy) main line. Each main line can have one siding, on either side of the diamond, and the signals respond appropriately based on the position of the switch points.

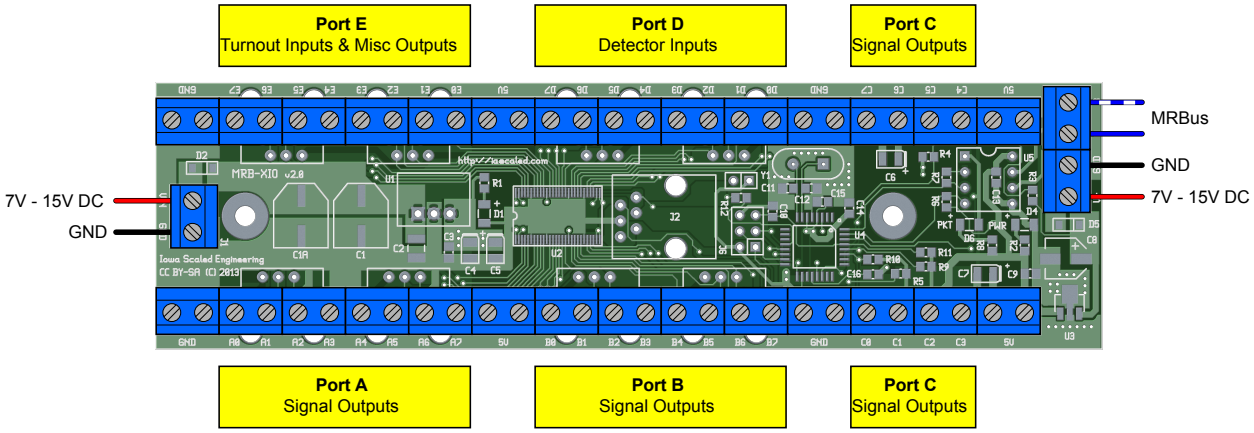
The MRB-IIAB can also enhanced the realism of a dummy main line by simulating trains – and optionally triggering a sound module – on the dummy main line, preventing movement through the diamond on the the active main line while the simulated train is present. Schedules for simulated trains are loaded into the module and then triggered based on fast time from an MRB-FCM fast clock module (sold separately). Up to 32 scheduled trains can be programmed into each MRB-IIAB module. Additionally, each simulated train can also trigger an automatic interchange, delivering cars to be picked up by the next main line train.

Track occupancy inputs accept logic-level signals from a variety of occupancy detectors. Both current-based (DCC) detectors such as the MRB-BD42 and optical/IR detectors such as the CKT-IRSENSE can be used. Other 3rd party detectors can also be used as long as they provide a logic level (or open-drain) output.

Signals are driven with 5V outputs capable of sourcing 10mA or sinking 20mA each. Configuration options allow the MRB-IIAB to control any combination of common-anode (+) and common-cathode (-) LED signals. Additional circuitry may be needed to drive incandescent type signals – contact us for details.

Installation

The MRB-IIAB consists of an input/output board containing 40 I/O pins, a microcontroller, voltage regulators, and an MRBus connection. The basic connections are shown below:



Power

There are 2 power inputs to the MRB-IIAB. Connector J1, on the left, powers the input and output circuitry. The power source connected there must be capable of supplying the full output current for all signals connected to the module.

single supply input, vs. 2 supply input

IO table

Connecting signals

Current limiting resistors on signals

Connecting detectors

pull-ups on detectors

Sound triggers

MRBus

Configuration

Operation

Signal logic overview (using test case diagrams?)

Applications

2 active main lines

1 active, 1 dummy

Swapping sidings

Changing signal color for proceed (main and siding)

auto interchange

using sound outputs to trigger crossing gates

Related Products

MRB-FCM

CKT-IRSENSE

MRB-BD4X

Open Design

Iowa Scaled Engineering is committed to creating open designs that users are free to build, modify, adapt, improve, and share with others.

Hardware

The design of the MRB-IIAB hardware is open source hardware, and is made available under the terms of the Creative Commons Attribution-Share Alike v3.0 license, a copy of which is available from: http://creativecommons.org/licenses/by-sa/3.0/

Design files can be found on the Iowa Scaled Engineering website:

http://www.iascaled.com/store/MRB-IIAB

Firmware

The official Iowa Scaled Engineering firmware for the MRB-IIAB is free software: you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation, either version 3 of the License, or (at your option) any later version. A copy of the GNU GPL can be found at: http://www.gnu.org/licenses/gpl.html

Stable releases of firmware and source code can be found on the Iowa Scaled Engineering website: http://www.iascaled.com/store/MRB-IIAB