System Description Document for the Turntable Universal Automatic Indexing Controller (TUAIC)

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# Objective

The purpose of this design is to retrofit universally to any model train turntable drive system, provide automatic indexing, and exceed the current performance metrics of existing products at a lower price point. This design uses drive system feedback to control drive motor output. It allows for user defined/programmed positions for roundhouse stall locations and turntable track entries. The user can select any programmed position, and the TUAIC will automatically maneuver the turntable into the selected position. This document details the requirements and design of the Turntable Universal Automatic Indexing Controller (TUAIC) component of the integrated turntable control system.

# System

# User Interface

## Modes

### Manual Control Mode

Shall turn CW/CCW with variable speed.

### Automatic Control Mode

Continuous Display Rotations.

Select “Head” or “Tail” to defined track.

### Configuration Mode

# Requirements

## System

TUAIC rotational speed shall vary monotonic at either end of movement

TUAIC shall support at least 42 programmed positions.

TUAIC position accuracy shall be ¼ of code 100 rail head = 0.25 mm = 0.010” = 1/32 of a degree.

TUAIC position shall be stored at interruption of power.

In an event of misalignment, re-calibration shall be accomplished with a single point.

Rotational Speed shall vary monotonic at either end of movement.

## User Interface

The UI shall support the three modes: Manual, Auto, and Config.

The UI shall depict rotation direction.

The UI shall show current mode: Manual, Auto, Cal, Busy, Complete

The UI shall have power switch.

The UI power shall be supplied from either AC or DC source defined by customer.