



# LRC224E

## Quick Start Guide

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## Purpose

The purpose of this document is to provide a simple set of instructions that describe the process to configure an LRC224E card, connect it to a SpeedLane Pro, and configure the SpeedLane Pro using Houston Radar Stats Analyzer.

## Revision History

1. Version 1.0, August 1, 2023 – Initial Release
2. Veresion 1.1 August 15, 2023

## Steps

### 1. [Set the dip switches settings.](#)

#### Radars Interface Options:

Serial communication settings for the card are controlled via a 4-position dip switch. It can be configured as RS232 or RS485, half-duplex or full duplex, with 120 Ohm termination on or off and with either high or low slew rate.

Under most conditions this port should be configured as RS485, full-duplex, not terminated and slow slew rate ( $\leq 250\text{kBaud}$ ). It is recommended to use the termination plug rather than enabling termination via the dip switch as it will be easier to visually identify the terminated card when using this method.

#### Baud:

Set the dip switch positions to select the desired baud rate. The software configuration (SW) dip switch option is not supported at this time. 115200 is the recommended baud rate for most installations.

#### Input Mapping:

Set the dip switch positions to the desired channels this card is responsible for. The dip switch configuration is different based on whether the purchased card is the 2 or four channel variant. The software configuration (SW) dip switch option is not supported at this time.

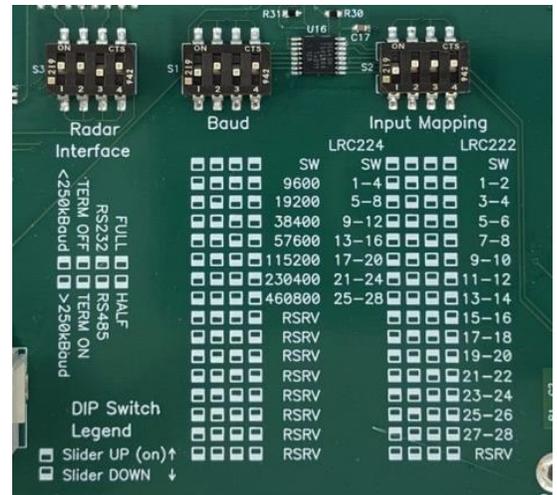


Figure 1. Dip Switches

## 2. [Connect the SpeedLane Pro to the LRC224E](#)

Install the LRC224E into your system, and make all necessary connections.

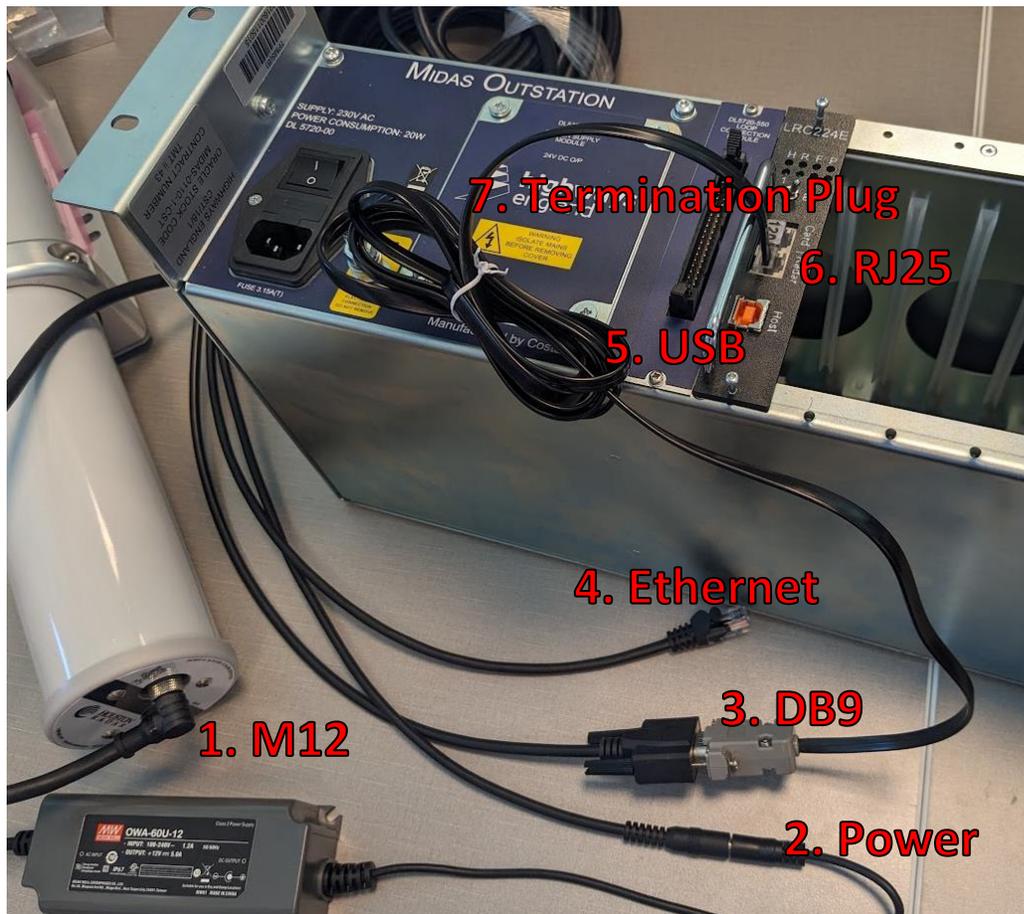


Figure 2. Connections

1. M12 Cable – All in one connector for the SpeedLane Pro.
2. Power – 12V power supply for the SpeedLane Pro.
3. DB9 – Serial communication connector for SpeedLane Pro. In this configuration, RS422 is being used.
4. Ethernet – Ethernet connection to be plugged into your network or directly into a PC with Houston Radar Stats Analyzer software installed.
5. USB – USB connection from LRC224E card to a PC with Houston Radar Stats Analyzer installed. This can be used to update firmware and run tests on the card. Not required for normal operation.
6. RJ25 – Serial communication ports for the LRC224E card. In this configuration, RS422 is being used. Both RJ25 ports are identical and exist to allow multiple cards to be connected on a single RS422 bus.
7. Termination Plug – RS485/RS422 termination plug. This plug should be installed in the free port on the last device on the RS485/RS422 bus.

### 3. [Define Lanes](#)

Connect to the SpeedLane Pro over Ethernet using Stats Analyzer version 9.00.0110 or later. Define lane parameters and traffic direction on the “SpeedLane Plot” tab.

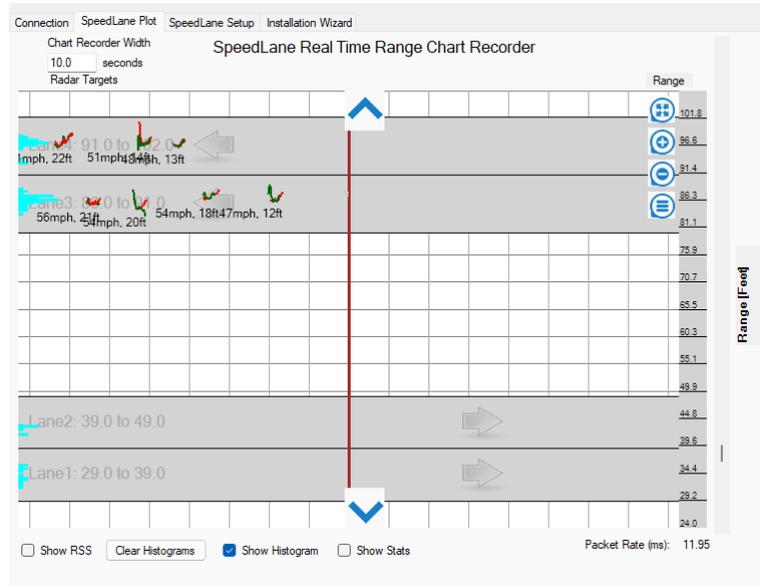


Figure 3. Define Lanes

### 4. [Configure Serial Connection](#)

Navigate to the “SpeedLane Setup” >> “Serial Port” tab. In most installations, you will set the baud rate to 115200, select RS422 (4 Wire Full Duplex), and enable Internal 120 Ohm Termination.

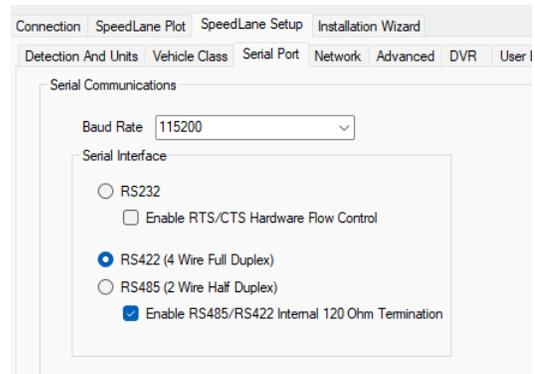


Figure 4. Configure Serial

### 5. [Enable Loop Card](#)

Navigate to the “SpeedLane Setup” >> “Loop Card” tab. Click the “Enable Loop Card” box.

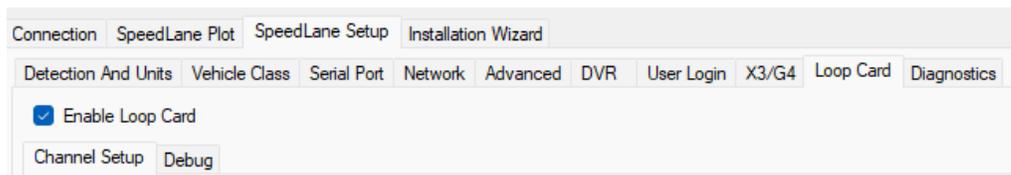


Figure 5. Enable Loop Card

## 6. Channel to Lane Mapping

Setup channels per lane on the "Loop Card" >> "Channel Setup" tab.

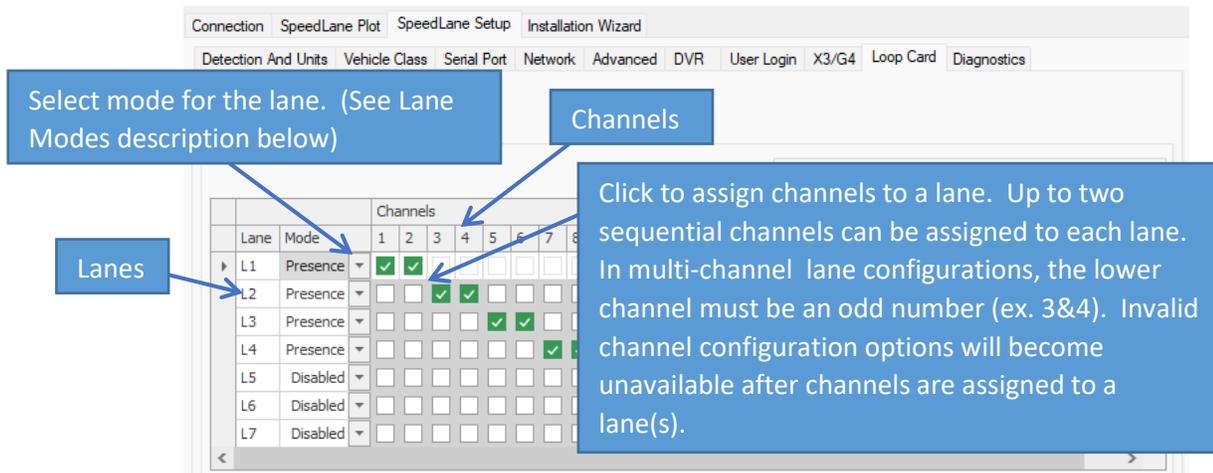


Figure 6. Channel to Lane Mapping

Lane Modes:

Disabled:

- No channels will be activated

Presence:

- Loop emulation mode where:
  - Channel activation time is a function of zone length, vehicle speed, and vehicle length
  - Channel activation delay is a function of zone spacing and vehicle speed
- Can be configured with one or two channels
- Two channels must be configured to determine speed and vehicle length
- Zone length must be provided
- Zone spacing must be provided for two channel configurations

Pulse:

- Channel activation time is configurable (default is 125ms)
- Can be configured with one or two channels
- Two channels must be configured to determine vehicle speed
- Zone spacing must be provided for two channel configurations

Realtime:

- Channel activation reflects the radar target detection status directly

## 7. Configure Zone Parameters

Configure the lane's zone parameters required for the selected mode.

The screenshot shows a configuration window for lane L5. Callout boxes provide the following information:

- Lane Selection:** Points to the lane tabs (L1-L12).
- Detection Zone Length:** Points to the 'Detection Zone Length (Feet)' field, which is set to 6.56. Callout: "Detection Zone Length is required for Presence mode single and two channel configurations. (See description below)".
- Detection Zone Spacing:** Points to the 'Detection Zone Spacing (Feet)' field, which is set to 8.20. Callout: "Detection Zone Spacing is required for Presence and Pulse mode two channel configurations. (See description below)".
- Lane Direction:** Points to the 'Lane Direction: Right' dropdown. Callout: "Lane Direction reflects the lane direction configured on the 'Lane Plot' tab."
- Copy to All Lanes:** Points to the 'Copy to All Lanes' button. Callout: "Copy to All Lanes will copy the displayed lane's zone settings to all other lanes with channels selected."
- Channel Order:** Points to the 'Channel Order' section showing 'C1' and 'C2' with a right-pointing arrow. Callout: "Channel Order is used to specify the channel activation order. Typically, this is set to match the lane direction."
- Delay:** Points to the 'Delay (ms)' field, which is set to 0. Callout: "Delay is a timing modifier that will result in a delay of channel activation. If delay is longer than the activation time, no activation will occur."
- Time Extension:** Points to the 'Time Extension (ms)' field, which is set to 0. Callout: "Time Extension is a timing modifier that will result in extended activation time for a channel."
- Pulse Duration:** Points to the 'Pulse Duration (ms)' field, which is set to 0. Callout: "Pulse Duration is used to set the pulse duration when a lane is in pulse mode."

Figure 7. Configure Zone Parameters

Detection Zone Length:  
The length of each zone along the lane

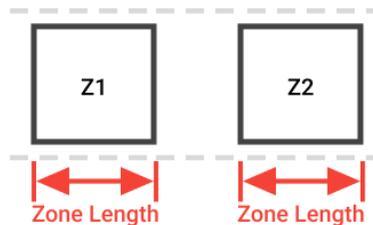


Figure 8. Zone Length

Detection Zone Spacing:  
The space between two zones in a lane.

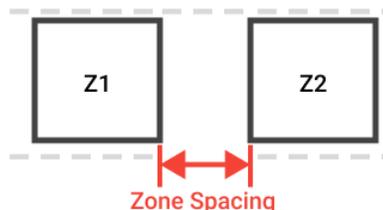


Figure 9. Zone Spacing

## 8. [LRC Discover \(Optional\)](#)

Click “Start LRC Discover” on the “Loop Card” >> “Channel Setup” or “Debug” tab. This will cause the SpeedLane to search for all cards present on the serial bus. Once the discovery has completed, a list of cards discovered and their configurations will be displayed on the “Debug” tab.

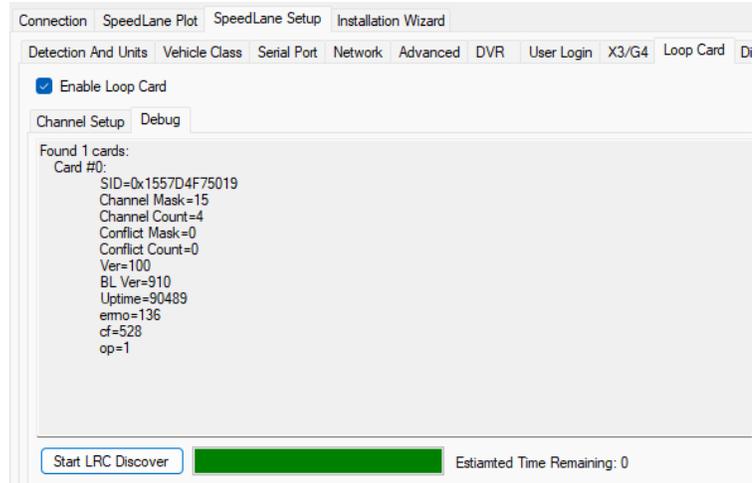


Figure 10. LRC Discover

## 9. [Channel Conflicts](#)

After “LRC Discover” has completed, open the “Loop Card” >> “Channel Setup” tab. If a channel conflict is detected, the corresponding column header will be highlighted red in the “Channel to Lane Mapping” table. A channel conflict occurs when more than one card has been assigned the same channel.

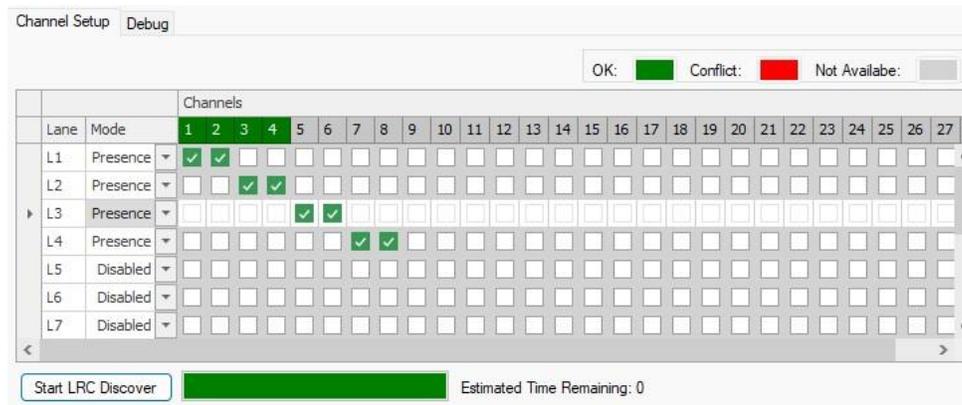


Figure 11. Channel Conflicts

## 10. Status LEDs

There are 8 LEDs on the front panel of the LRC22X.

H: Host serial port receive data status

This LED will activate when data is being received on the host configuration serial port (USB interface).

R: Radar serial port receive data status

This LED will activate when data is being received on from the radar serial port (RS485/RS232).

F: Fault condition

This LED will activate when communication loss between the LRC22X and the radar has been detected. When the system is configured and running, this LED should never be activated.

P: Power present

This LED will activate whenever power is connected to the LRC22X.

1-4: Channel activation status.

These LEDs activate when the corresponding channels on the card activate. The behavior of these LEDs will vary based on the mode and options selected for a given channel.



Figure 12. Status LEDs

Questions? Call us at 1-888-602-3111 and select “Tech Support” option or email us at [contact@houston-radar.com](mailto:contact@houston-radar.com).