

Integrating Leddar™ Modules into Your Application

The Challenge

A growing number of solution providers are integrating sensors into their applications. Designing an effective solution that meets all market requirements is very challenging, and off-the-shelf sensors often come with hardware and interface constraints that lead to difficult tradeoffs between features and cost. Moreover, developers usually have to develop their own tools and build interface software from scratch. What if a new detection and ranging technology—through its unique form factor, interfaces and tools—could enable developers to use its built-in expertise while facilitating hardware integration and application development? With several interfaces and beam options to choose from and an extensive software package, Leddar™ modules and assemblies constitute a leading sensing solution, particularly due to the easy integration and precision offered by this patented LED-based detection and ranging technology.

The Solution: The Leddar™ Sensor Module

The Leddar™ Sensor Module can be used in very simple or more complex tasks alike, as it is highly configurable and its operation can be tailored to specific application requirements. For example, a number of parameters allow for the optimization of the measurement rate and range of detection. It contains a receiver assembly, as well as a source and control assembly, and features 16 detection segments, various beam width options (9° to 95°), and real-time data acquisition.

To facilitate custom application development, several interfaces and communication links are also provided, namely:

- CAN bus (proprietary protocol)
- UART (Modbus)
- USB (proprietary protocol)
- RS-485 (Modbus)

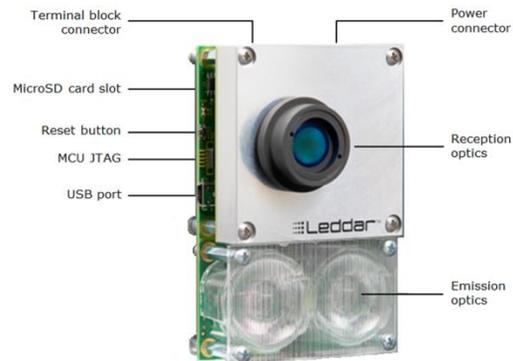


Fig. 1 — Leddar™ Sensor Module (45° optics)

The Integration Tools

CONFIGURATION SOFTWARE

The dedicated configuration software allows for easy connection and quick setup according to your application and preferences. Some of the functions most appreciated by integrators include:

Data Viewing and Raw Detections: The software plots the detected objects in a graphical view of the beam (lateral position and distance) and provides a separate window to view the details of the measurements. The raw detections window provides filters to isolate segments and detection parameters to display measurements of interest, which avoids having to go through superfluous data.

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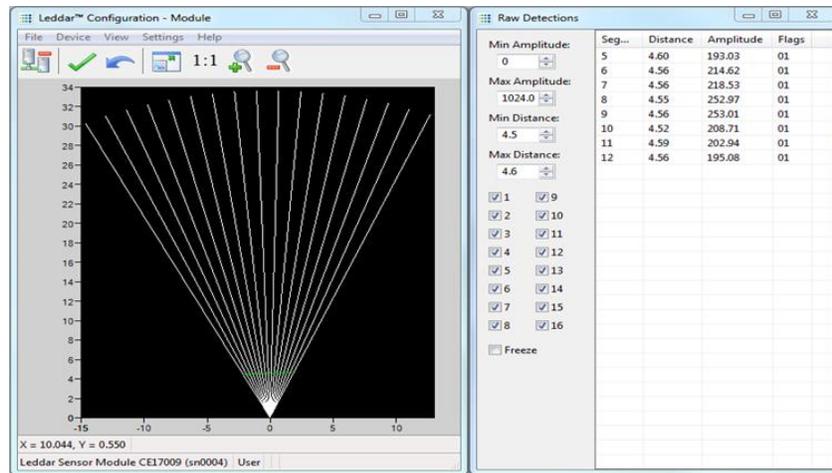


Fig. 2 — Example of data viewing using Raw Detections with filters

Recording and Playback: Sensor data may be recorded with the software and played back offline to view the results. Playback can be either continuous or the user can pause step through the data one frame at a time. Offline data visualization can be used for analysis, verification, troubleshooting, or training purposes.

Data Logging: This function is used to output the data to a text file, which can be imported into a software application, such as Microsoft Excel, for offline analysis. The duration of the record is indicated in the status bar, and each line of the generated text file contains the information related to a single detection.

SOFTWARE DEVELOPMENT KIT

The Software Development Kit provides an easy-to-use and effective application programming interface (API) with .Net and C libraries and example code, allowing Windows developers to quickly create applications that control the sensor settings and acquire the measurements at the sensor's full rate of operation (USB link). Sample code for RS-485/Modbus for both Windows and Linux are also provided.

In addition, with the included LabVIEW and MATLAB integration examples, you can immediately start experimenting, exploring and developing with Leddar™ technology, accelerating the process from idea to application.



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The Benefits

By integrating LeddarTech's ready-to-use Leddar™ Sensor Module, you benefit from advanced detection and ranging technology and numerous valuable features:

Features	Benefits
Configuration Software and Development Kit	Unmatched ease of integration
No moving parts	Rugged, reliable solution
Large illumination area	Optimization of detection robustness in all weather conditions
Full waveform analysis	Multiple object detection per channel
Signal accumulation	Long detection range with low-power LEDs
Multiple fields of view	Lateral discrimination
Rapid acquisition rate	Real-time object tracking
Short, diffused LED pulses	Inherently eye-safe

If you would like to see for yourself how well the technology works and how easily it can be integrated, a low-cost evaluation kit is readily available for trial purposes.

Product References

- Leddar™ Sensor Module
- Leddar™ Software Development Kit
- Leddar™ Platform Sensor Evaluation Kit