# CTI-AR4000 Software Library

## *for* Acuity AR4000 Laser Distance Sensors

The Crandun Technologies CTI-AR4000 software library provides a high-performance, high-level interface to the Acuity AR4000 series laser distance sensors. Whether for "one-off" prototypes, or high-volume, high-performance embedded systems, this is *the* most cost-effective time to market solution for your project.

### Rapid Prototyping!

Install the software, then use the provided sample programs or Microsoft Excel to acquire, display and analyze sensor data immediately. No programming required!

### Get Up and Running Quickly

The "plug-and-play" functionality, and numerous sample programs, get you up and running quickly, so that you can concentrate on your application functionality, rather than on hardware interfacing or data collection details. The extensive documentation and free support make sure that you are successful.

### Windows or Linux – Desktop or Embedded

Available for Windows NT/98/Me/2000/XP and Linux. Whether it's Windows on a desktop PC, or Linux on an embedded PC104, the same extensive functionality is available. Pick the system that suits you best.

### High Performance. Versatile.

Carefully tuned for maximum performance. Small memory footprint. Usable from C, C++ and Visual Basic. Multiple sensor support. Full motor/encoder control. Whatever your situation, the library support the most demanding applications.

## Features

The CTI-AR4000 software library has been designed for ease of use, to get your project finished quickly. The library's "plug-and-play" functionality handles all the details of data collection from the sensor, allowing you to concentrate on using that data in your specific application. No programming is needed to acquire data directly into a Microsoft Excel spreadsheet. For more complex needs, the comprehensive Programmer's Guide and extensive code samples facilitate the rapid development of custom applications in C, C++ or Visual Basic. A variety of features enhance productivity, and reduce your project timelines:

### Flexible Output Formatting and Filtering

The library provides facilities to easily perform many of the common operations, such as data formatting/conversion and filtering, which would otherwise need to be programmed by an application developer.

The AR4000 sensor's serial interface can transmit ASCII or binary data to the host computer. ASCII format, although more convenient, limits the maximum sample rate due to the additional data sent over the serial link. The library uses binary data transmission, with conversion on the host computer, to maximize sample rates. Either English or metric output units may be selected and a user specified offset and/or scale factor may be added to the samples.

To reduce application complexity and improve user productivity, the library supports filtering of the raw data stream to exclude samples outside of a particular range of interest.

## Configurable Data Buffering and Callback Notification

The CTI-AR4000 library continuously acquires and stores range samples from the AR4000 sensor without any special action on the part of the user. When the desired number of samples are available, they can easily be retrieved for immediate display or further processing.

The library manages all data buffering, eliminating data overrun concerns that can arise when acquiring high-speed data directly from the serial port. When a predefined number of samples are ready, the library sets a queryable status flag, or calls a user-defined callback function, enabling the user to readily determine when a desired number of samples is ready.

The library handles the details, while you concentrate on *using* the data.

## Performance

Highly optimized, the library provides the best possible performance for your application. Internally, the library is fully multi-threaded and interrupt driven for maximum throughput.

## Easy Integration

The library makes it easy to collect data from other sensors or external data sources, such as encoders, A-D converters, data loggers, etc., simultaneously with range measurements from the AR4000 sensor, as part of an integrated data acquisition system.

## Comprehensive Support

To ensure your success, we provide numerous fully documented examples, complete with source code, to give you a head-start in developing your applications. For questions not answered by the documentation or the sample programs, we provide free email and telephone support.

## Code Sample

The Visual Basic® sample below illustrates a very simple example of using the library functions (shown *highlighted in italics*) to acquire and display range data from the AR4000 sensor.

```
Dim rc As Long, numRead as Long, i as Long
Dim samples(1000) As Double

dim mySensor As CTI_AR4000                  'Declare an AR4000 sensor variable

Set mySensor = New CTI_AR4000               'Create a new instance of the AR4000 sensor class

rc = mySensor.setCommOpen("COM1", 9600)     'Tell library which serial port & baud rate to use
If (rc < 0) Then MsgBox "Failed to set communications parameters", vbCritical

rc = mySensor.setSamplesPerSec(150)         'Set 150 samples per second
If (rc < 0) Then MsgBox "Failed to set Sample Rate", vbCritical

rc = mySensor.setLaserOn()                  'Turn on the laser
If (rc < 0) Then MsgBox "Failed to turn on Laser", vbCritical

numRead = mySensor.getSamples(samples, 100)  'Read 100 range samples from the laser
If (numRead < 0) Then
        MsgBox "Failed to read data from laser", vbCritical
Else
        MsgBox "Successfully read data from laser", vbInformation
        For i = 1 To numRead
                MsgBox "Sample" + Str(i) + " = " + Str(samples(i)), vbInformation
        Next i
End If
```

## For Further Information

For more information, including downloadable user manuals, and answers to frequently asked questions (FAQs), please consult our web site, or contact:

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