

# FxP LIBRARY

## ADD TRUE FIXED-POINT ARITHMETIC CAPABILITIES TO MATLAB™

- ☐ Easy Integration into MATLAB™ Package
- ☐ Add True Fixed-Point Arithmetic to MATLAB™
- ☐ Fixed-Point Precision Means Direct Mapping to Hardware DSP's
- ☐ Supports Signed, Unsigned, Modulo, and Saturation Arithmetic
- ☐ Simple Conversion From Default FP MATLAB™ to Fixed Point Arithmetic



The Catalytic Fixed-Point Library is a MATLAB™ package enabling users to write computations using fixed-point arithmetic rather than the default double precision floating-point arithmetic provided in MATLAB. The library executes fixed-point operations precisely. This means that results are identical in precision and accuracy to operations executed on typical fixed-point hardware such as that found on a Digital Signal Processor (DSP). Signed and unsigned operands are supported, as are modulo and saturation arithmetic. The library provides both real and complex fixed-point numbers. Rounding modes for results can be selected from round to nearest, round towards zero, round toward positive infinity, and round toward negative infinity.

The Catalytic Compilers Fixed-Point Library makes it simple to convert computations written using default, double precision MATLAB into fixed-point arithmetic. Because the Catalytic Fixed-Point Library uses the class and operator-overloading features of MATLAB, converting a working double precision program into fixed-point arithmetic usually requires only the insertion of a small number of constructors and assignment statements.

Transcendental functions are essential to many fixed-point applications but vary widely by application as far as the amount of precision required. Typically these functions are hand-written by applications programmers to provide just the amount of precision required. The only way to exactly match the precision of such functions over their entire domain is to use those functions directly. Thus, the Catalytic Fixed-Point Library provides a facility allowing transcendental functions written in C to be easily plugged into an application. In addition to providing MATLAB applications with the exact precision that a final application will have, this facility also permits early prototyping and exploration of DSP transcendental functions.

The basic Catalytic Fixed-Point Library allows users to write their own functions using fixed-point operations and call a large number of basic MATLAB functions with fixed-point arguments, obtaining fixed-point results. The enhanced Catalytic Fixed-Point Library extends fixed-point support to include both the Signal Processing and Communications toolboxes of MATLAB<sup>1</sup>.

For more information about how we can catalyze your design, send email to [info@catacomp.com](mailto:info@catacomp.com)

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<sup>1</sup> In order to use the extended features of the enhanced Catalytic Fixed-Point Library, you must be licensed for the appropriate MATLAB™ toolboxes (Signal Processing, Communications, or both) from The MathWorks, Inc.