

# Formula Support

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## 1. Introduction

This document describes the current state of formula support in POI. The information in this document applies to the 2.0-dev version of POI (i.e. CVS HEAD). Since this area is a work in progress, this document will be updated with new features as and when they are added.

## 2. The basics

In `org.apache.poi.hssf.usermodel.HSSFCell` `setCellFormula("formulaString")` is used to add a formula to sheet and `getCellFormula()` is used to retrieve the string representation of a formula.

We aim to support the complete excel grammar for formulas. Thus, the string that you pass in to the `setCellFormula` call should be what you expect to type into excel. Also, note that you should NOT add a "=" to the front of the string.

## 3. Supported Features

- Cell References
- String, integer and floating point literals
- Area references
- Relative or absolute references
- Arithmetic Operators
- Sheet Functions

## 4. Partially supported

- The formula parser now has the ability to parse formulas containing strings. However formulas that return a string value are not yet supported.
- Formula tokens in Excel are stored in one of three possible *classes* : Reference, Value and Array. Based on the location of a token, its class can change in complicated and undocumented ways. While we have support for most cases, we are not sure if we have

covered all bases (since there is no documentation for this area.) We would therefore like you to report any occurrence of #VALUE! in a cell upon opening a POI generated workbook in excel. (Check that typing the formula into Excel directly gives a valid result.)

## 5. Not yet supported

- Array formulas
- Formulas with logical operations (IF)
- Sheet References in formulas
- Everything else :)

## 6. Internals

Formulas in Excel are stored as sequences of tokens in Reverse Polish Notation order. The [open office XLS spec](#) is the best documentation you will find for the format.

The tokens used by excel are modelled as individual \*Ptg classes in the **org.apache.poi.hssf.record.formula** package.

The task of parsing a formula string into an array of RPN ordered tokens is done by the **org.apache.poi.hssf.record.formula.FormulaParser** class. This class implements a hand written recursive descent parser.

Check out the [javadocs](#) for details.