

# f90\_kind: KIND Number Parameters Module

March 11, 2024

## 1 Name

f90\_kind — Module providing useful KIND number parameters

## 2 Usage

USE F90\_KIND

## 3 Synopsis

### Parameters

ASCII, BYTE, DOUBLE, INT16, INT32, INT64, INT8, JIS, LOGICAL64, QUAD, REAL128, REAL32, REAL64, REAL64x2, SINGLE, TWOBYTE, UCS2, UCS4, WORD.

## 4 Parameter Description

INTEGER,PARAMETER :: SINGLE

For REAL and COMPLEX, selects the default real or default complex kind; this is equivalent to leaving the KIND selector off entirely.

INTEGER,PARAMETER :: DOUBLE

Selects the double precision real kind; this is equivalent to declaring REAL entities using the DOUBLE PRECISION type specifier, to declaring COMPLEX entities using COMPLEX(KIND(0d0)), and to using the exponent letter D on literal constants.

INTEGER,PARAMETER :: QUAD

REAL/COMPLEX kind selector for real and complex types with approximately twice the precision of DOUBLE. This might not be available on some systems; on a system without this type, the value of this parameter will be negative.

INTEGER,PARAMETER :: REAL16

REAL/COMPLEX kind selector for real and complex types that are represented using 16-bit floating-point numbers.

INTEGER,PARAMETER :: REAL32

REAL/COMPLEX kind selector for real and complex types that are represented using 32-bit floating-point numbers.

INTEGER,PARAMETER :: REAL64

REAL/COMPLEX kind selector for real and complex types that are represented using 64-bit floating-point numbers.

INTEGER,PARAMETER :: REAL64x2

**REAL/COMPLEX** kind selector for real and complex types that are represented using “double-double” floating-point numbers. A double-double floating-point number consists of two 64-bit values, one of which is at least **DIGITS(1.REAL64)** smaller than the other; this has almost twice the precision of **REAL64** (except when near zero), but a smaller exponent range.

This type is not available on all systems; on a system without this type, the value of this parameter is  $-1$ .

**INTEGER,PARAMETER :: REAL128**

**REAL/COMPLEX** kind selector for real and complex types that are represented using 128-bit floating-point numbers. This will select a “true 128-bit” floating-point type if one is available, and if not it will select a “double-double” floating-point type if that is available; if no 128-bit floating-point type is available the value of this parameter is -1.

**INTEGER,PARAMETER :: INT8**

**INTEGER** kind selector for integer types with at least 8 bits of precision.

**INTEGER,PARAMETER :: INT16**

**INTEGER** kind selector for integer types with at least 16 bits of precision.

**INTEGER,PARAMETER :: INT32**

**INTEGER** kind selector for integer types with at least 32 bits of precision.

**INTEGER,PARAMETER :: INT64**

**INTEGER** kind selector for integer types with at least 64 bits of precision.

**INTEGER,PARAMETER :: BYTE**

**LOGICAL** kind selector for logical types occupying only one byte of memory.

**INTEGER,PARAMETER :: TWOBYTE**

**LOGICAL** kind selector for logical types occupying the same space as **INTEGER(INT16)** entities.

**INTEGER,PARAMETER :: WORD**

**LOGICAL** kind selector for a 32-bit logical type.

**INTEGER,PARAMETER :: LOGICAL64**

**LOGICAL** kind selector for a 64-bit logical type.

**INTEGER,PARAMETER :: ASCII**

**CHARACTER** kind selector for the ASCII character set.

**INTEGER,PARAMETER :: JIS**

**CHARACTER** kind selector for the JIS X 0213:2004 character set.

**INTEGER,PARAMETER :: UCS2**

**CHARACTER** kind selector for the UCS-2 (Unicode) character set.

**INTEGER,PARAMETER :: UCS4**

**CHARACTER** kind selector for the UCS-4 (ISO 10646) character set.

## 5 Notes

The source code for this module can be found in the NAG Fortran runtime library directory (on Unix this is usually ‘/usr/local/lib/NAG\_Fortran’ or ‘/opt/NAG\_Fortran/lib’, and on Windows it is usually ‘C:\Program Files\NAG\EFBuilderPro\NAG\_Fortran\lib’).

## 6 See Also

`nagfor(1)`, `nag_modules(3)`.

## 7 Bugs

Please report any bugs found to ‘support@nag.co.uk’ or ‘support@nag.com’, along with any suggestions for improvements.