

## NAG Library Function Document

### nag\_glopt\_opt\_set (e05zkc)

#### 1 Purpose

nag\_glopt\_opt\_set (e05zkc) either initializes or resets the optional argument arrays or sets a single optional argument for supported problem solving functions in Chapter e05. The following functions are supported:

```
nag_glopt_bnd_pso (e05sac),
nag_glopt_nlp_pso (e05sbc),
nag_glopt_nlp_multistart_sqp (e05ucc),
nag_glopt_nlp_multistart_sqp_lsq (e05usc).
```

#### 2 Specification

```
#include <nag.h>
#include <nage05.h>
void nag_glopt_opt_set (const char *optstr, Integer iopts[], Integer liopts,
    double opts[], Integer lopts, NagError *fail)
```

#### 3 Description

nag\_glopt\_opt\_set (e05zkc) has three purposes: to initialize optional argument arrays; to reset all optional arguments to their default values; or to set a single optional argument to a user-supplied value.

Optional arguments and their values are, in general, presented as a character string, **optstr**, of the form '*option = optval*'; alphabetic characters can be supplied in either upper or lower case. Both *option* and *optval* may consist of one or more tokens separated by white space. The tokens that comprise *optval* will normally be either an integer, real or character value as defined in the description of the specific optional argument. In addition all optional arguments can take an *optval* DEFAULT which resets the optional argument to its default value.

It is imperative that optional argument arrays are initialized before any options are set, before the relevant problem solving function is called and before any options are queried using nag\_glopt\_opt\_get (e05zlc). To initialize the optional argument arrays **iopts** and **opts** for a specific problem solving function, the option **Initialize** is used with *optval* identifying the problem solving function to be called, via its short name. For example, to initialize optional argument arrays to be passed to nag\_glopt\_bnd\_pso (e05sac), nag\_glopt\_opt\_set (e05zkc) is called as follows:

```
nag_glopt_opt_set("Initialize = e05sac", iopts, liopts, opts, lopts, &fail)
```

Information relating to available option names and their corresponding valid values is given in Section 12 in nag\_glopt\_bnd\_pso (e05sac), nag\_glopt\_nlp\_pso (e05sbc), nag\_glopt\_nlp\_multistart\_sqp (e05ucc) and nag\_glopt\_nlp\_multistart\_sqp\_lsq (e05usc).

#### 4 References

None.

## 5 Arguments

- 1: **optstr** – const char \* *Input*  
*On entry:* a string identifying the option to be set.  
**Initialize** = *function name*  
 Initialize the optional argument arrays **iopts** and **opts** for use with function *function name*, where *function name* is the short name associated with the function of interest.  
**Defaults**  
 Resets all options to their default values.  
*option* = *optval*  
 See Section 12 in nag\_glopt\_bnd\_pso (e05sac), nag\_glopt\_nlp\_pso (e05sbc), nag\_glopt\_nlp\_multistart\_sqp (e05ucc) and nag\_glopt\_nlp\_multistart\_sqp\_lsq (e05usc) for details of valid values for *option* and *optval*. The equals sign (=) delimiter must be used to separate the *option* from its *optval* value.  
**optstr** is case insensitive. Each token in the *option* and *optval* component must be separated by at least one space.
- 2: **iopts**[**liopts**] – Integer *Communication Array*  
*On entry:* optional argument array.  
 If **optstr** has the form **Initialize** = *function name*, the contents of **iopts** need not be set.  
 Otherwise, **iopts** MUST NOT have been altered since the last call to nag\_glopt\_opt\_set (e05zkc), nag\_glopt\_opt\_get (e05zlc) or the selected problem solving function.  
*On exit:* dependent on the contents of **optstr**, either an initialized, reset or updated version of the optional argument array.
- 3: **liopts** – Integer *Input*  
*On entry:* the length of the array **iopts**.  
*Constraint:* unless otherwise stated in the documentation for a specific, supported, problem solving function, **liopts**  $\geq$  100.
- 4: **opts**[**lopts**] – double *Communication Array*  
*On entry:* optional argument array.  
 If **optstr** has the form **Initialize** = *function name*, the contents of **opts** need not be set.  
 Otherwise, **opts** MUST NOT have been altered since the last call to nag\_glopt\_opt\_set (e05zkc), nag\_glopt\_opt\_get (e05zlc) or the selected problem solving function.  
*On exit:* dependent on the contents of **optstr**, either an initialized, reset or updated version of the optional argument array.
- 5: **lopts** – Integer *Input*  
*On entry:* the length of the array **opts**.  
*Constraint:* unless otherwise stated in the documentation for a specific, supported, problem solving function, **lopts**  $\geq$  100.
- 6: **fail** – NagError \* *Input/Output*  
 The NAG error argument (see Section 3.6 in the Essential Introduction).

## 6 Error Indicators and Warnings

### NE\_ALLOC\_FAIL

Dynamic memory allocation failed.

### NE\_BAD\_PARAM

On entry, argument  $\langle value \rangle$  had an illegal value.

### NE\_INT

On entry, **liopts** =  $\langle value \rangle$ .  
Constraint: **liopts**  $\geq \langle value \rangle$ .

On entry, **lopts** =  $\langle value \rangle$ .  
Constraint: **lopts**  $\geq \langle value \rangle$ .

### NE\_INTERNAL\_ERROR

An internal error has occurred in this function. Check the function call and any array sizes. If the call is correct then please contact NAG for assistance.

### NE\_INVALID\_FORMAT

On entry, could not convert the specified *optval* to an integer: **optstr** = " $\langle value \rangle$ ".

On entry, could not convert the specified *optval* to a real: **optstr** = " $\langle value \rangle$ ".

On entry, the expected delimiter '=' was not found in **optstr**: **optstr** = " $\langle value \rangle$ ".

The *option* in **optstr** is associated with a numerical value. However, the *optval*, " $\langle value \rangle$ ", present in **optstr** could not be fully interpreted.

### NE\_INVALID\_OPTION

On entry, either the option arrays have not been initialized or they have been corrupted.

On entry, the optional argument in **optstr** was not recognized: **optstr** = " $\langle value \rangle$ ".

### NE\_INVALID\_VALUE

On entry, the *optval* supplied for the character optional argument is not valid.  
**optstr** = " $\langle value \rangle$ ".

On entry, the *optval* supplied for the integer optional argument is not valid.  
**optstr** = " $\langle value \rangle$ ".

On entry, the *optval* supplied for the real optional argument is not valid.  
**optstr** = " $\langle value \rangle$ ".

### NE\_NOT\_FUN\_NAME

On entry, the *option* in **optstr** has been detected as **Initialize**, however the *optval*, " $\langle value \rangle$ ", associated with **optstr** has not been recognized as a valid function name.

## 7 Accuracy

Not applicable.

## 8 Parallelism and Performance

Not applicable.

## 9 Further Comments

Some options have default values which are problem dependent. For example the option **Maximum Iterations Completed** for nag\_glopt\_bnd\_pso (e05sac) has the default value  $1000 \times \mathbf{ndim}$ . If options such as this are set, they may only be set to constant values. If such an option is reset to its DEFAULT value its dependence on the specific problem will be restored.

## 10 Example

See the example programs associated with the problem solving function you wish to use for a demonstration of how to use nag\_glopt\_opt\_set (e05zkc) to initialize option arrays and set options.

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