

# EN and ENO



(Original Document)

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## Description

An EN input and an ENO output can be configured for the FFBs.

If the value of EN is equal to "0" when the FFB is invoked, the algorithms defined by the FFB are not executed and ENO is set to "0".

If the value of EN is equal to "1" when the FFB is invoked, the algorithms defined by the FFB will be executed. After the algorithms have been executed successfully, the value of ENO is set to "1". If certain error conditions are detected when executing these algorithms, ENO is set to "0".

If the EN pin is not assigned a value, when the FFB is invoked, the algorithm defined by the FFB is executed (same as if EN equals to "1"). Please refer to [Maintain output links on disabled EF](#).

If the algorithms are executed successfully, then value of ENO is set to "1", else ENO is set to "0".

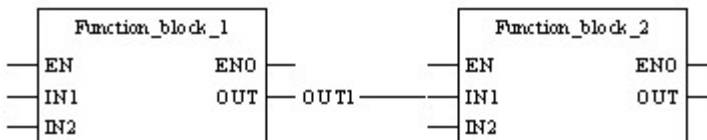
If ENO is set to "0" (caused by EN=0 or a detected error condition during execution or unsuccessful algorithm execution):

- Function blocks
  - EN/ENO handling with function blocks that (only) have one link as an output parameter:



If EN from FunctionBlock\_1 is set to "0", the output connection OUT from FunctionBlock\_1 retains the status it had in the last correctly executed cycle.

- EN/ENO handling with function blocks that have one variable and one link as output parameters:



If EN from FunctionBlock\_1 is set to "0", the output connection OUT from FunctionBlock\_1 retains the status it had in the last correctly executed cycle. The variable OUT1 on the same pin, either retains its previous status or can be changed externally without influencing the connection. The variable and the link are saved independently of each other.

- Functions/Procedures

**NOTE:** Unity Pro is the former name of Control Expert for version 13.1 or earlier.

### CAUTION

#### UNEXPECTED BEHAVIOR OF EQUIPMENT

For Unity Pro V4.0 and earlier versions, do not use links to connect function blocks outputs, when your application relies on persistent output data of an EF.

**Failure to follow these instructions can result in injury or equipment damage.**

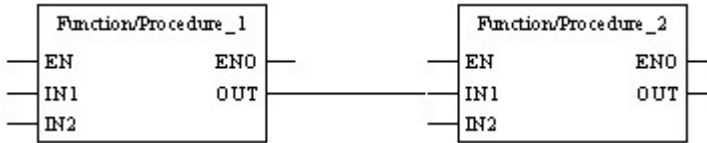
**NOTE:** With Unity Pro V4.0 and earlier versions the deactivation of an EF (EN=0) causes links connected to its Input/Output to be reset. To transfer the state of the signal do not use a link. A variable must be connected to the EF's output and must be used to connect the input of the element. With Unity Pro V4.1 and later versions you can maintain the output links even if an EF is

deactivated by activating the option **Maintain output links on disabled EF (EN=0)** via the menu **Tools** → **Program** → **Languages** → **Common**.

As defined in IEC61131-3, the outputs from deactivated functions (EN-input set to "0") is undefined. (The same applies to procedures.)

Here is an explanation of the output status in this case:

- EN/ENO handling with functions/procedures that (only) have one link as an output parameter:



If EN from Function/Procedure\_1 is set to "0", the output connection OUT from Function/Procedure\_1 is also set to "0".

- EN/ENO handling with function blocks that have one variable and one link as output parameters:



If EN from Function/Procedure\_1 is set to "0", the output connection OUT from Function/Procedure\_1 is also set to "0". The variable OUT1 on the same pin, either retains its previous status or can be changed externally without influencing the connection. The variable and the link are saved independently of each other.

The output behavior of the FFBs does not depend on whether the FFBs are called up without EN/ENO or with EN=1.

### Conditional/Unconditional FFB Call

"Unconditional" or "conditional" calls are possible with each FFB. The condition is realized by pre-linking the input EN.

- EN connected
  - conditional calls (the FFB is only processed if EN = 1)
- EN shown, hidden, and marked TRUE, or shown and not occupied
  - unconditional calls (FFB is processed independent from EN)

**NOTE:** For disabled function blocks (EN = 0) with an internal time function (e.g. DELAY), time seems to keep running, since it is calculated with the help of a system clock and is therefore independent of the program cycle and the release of the block.

## CAUTION

### UNEXPECTED APPLICATION EQUIPMENT

Do not disable function blocks with internal time function during their operation.

**Failure to follow these instructions can result in injury or equipment damage.**

### Note for IL and ST

The use of EN and ENO is only possible in the text languages for a formal FFB call, e.g.

```
MY_BLOCK (EN:=enable, IN1:=var1, IN2:=var2,
ENO=>error, OUT1=>result1, OUT2=>result2);
```

Assigning the variables to ENO must be done with the operator =>.

With an informal call, EN and ENO cannot be used.