

Tunable parameter

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imperix • in

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The tunable parameter block creates a variable that can be altered in real-time using [imperix Cockpit](#). It supports the *int32*, *uint32*, and *float* data types.

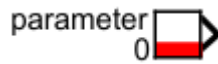
Simultaneously, the tunable parameter can also be modified through the CAN bus or via Ethernet UDP/IP

In simulation, the block can be configured to perform steps at predefined timestamps.

Simulink block

Signal specification

The block propagates the variable value to its output signal.



Standard parameters

- **Variable name:** sets the variable name. This name must start with a character and must not contain any spaces or special characters except for the “_” character.
- **Initial value (vectorizable):** sets the initial value of the variable.
- **Data type:** sets the variable type (*int32*, an *uint32*, or *single*)

Simulation parameters

- **Simulation output** must be set to *steps* to enable the generation of steps in simulation.
- **Step times (vectorizable)** specifies the time points when the steps occurs (in seconds).
- **Data points (vectorizable)** specifies the steps to perform at each defined time point.

The tunable parameters can also be altered through the CAN bus similar to a [CAN input mailbox](#) or via UDP/IP, similar to an [Ethernet input mailbox](#).

Block Parameters: Tunable parameter

Tunable parameter

Creates a variable that can be watched and altered in real-time using imperix Cockpit.

For instance, it may be used to tune controller setpoints.

Variable CAN Ethernet (UDP) Simulation

Variable declaration

Variable name

Initial value

Data type

Variable saturation

Upper limit (Inf for unlimited)

Lower limit (-Inf for unlimited)

OK Cancel Help Apply

Block Parameters: Tunable parameter

Tunable parameter

Creates a variable that can be watched and altered in real-time using imperix Cockpit.

For instance, it may be used to tune controller setpoints.

Variable CAN Ethernet (UDP) Simulation

☒ Enable ethernet

Ethernet port number(s) 2000

Byte order Little-endian

OK Cancel Help Apply

Block Parameters: Tunable parameter

Tunable parameter

Creates a variable that can be watched and altered in real-time using imperix Cockpit.

For instance, it may be used to tune controller setpoints.

Variable CAN Ethernet (UDP) Simulation

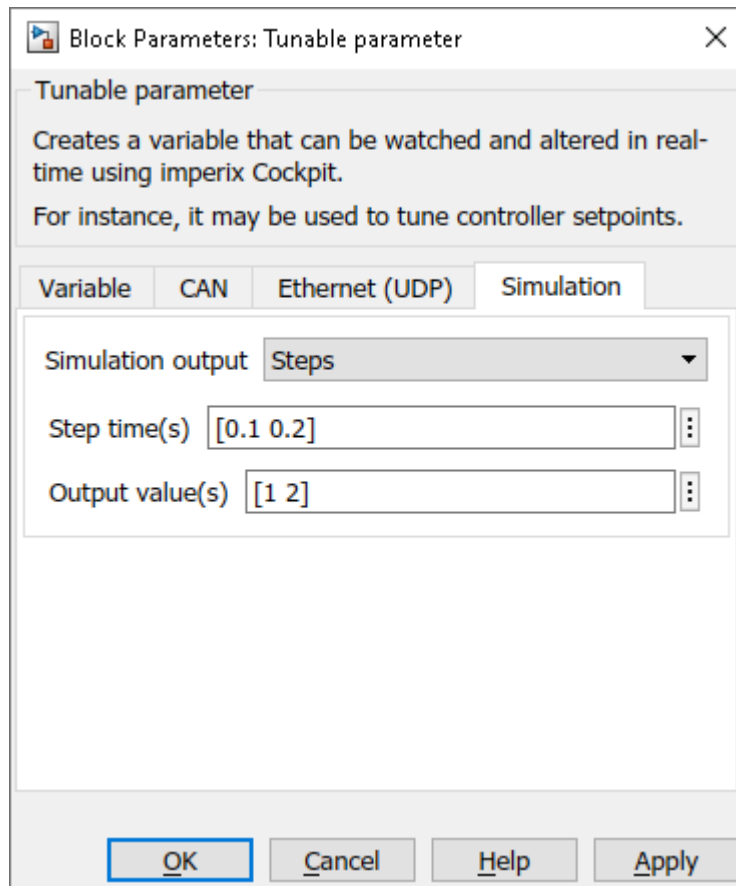
☒ Enable CAN

CAN address 0

Byte order Little-endian

Baud rate (bits/s) 1000000

OK Cancel Help Apply



PLECS block

Signal specification

The block propagates the variable value to its output signal.

When the `initial value` parameter is a vector, N variables are created where N is the vector size. For example, if the tunable block is named `value`, 3 variables named `value_0`, `value_1` and `value_2` are created.

param_name 0 

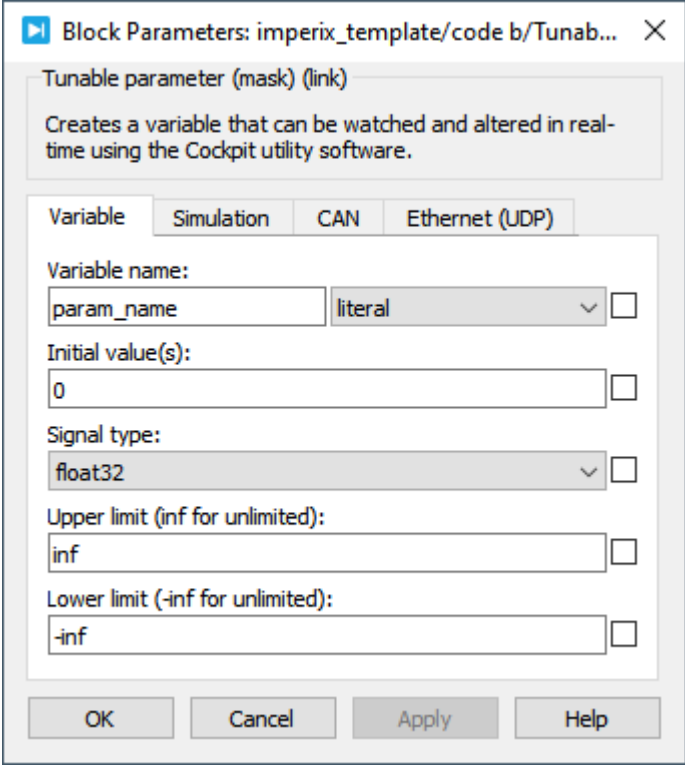
Standard parameters

- `Name of the tunable parameter`: sets the variable name. This name must start with a character and must not contain any spaces or special characters except for the “_” character.
- `Initial value(vectorizable)`: sets the initial value of the variable.
- `Signal type`: sets the variable type (*int32*, an *uint32*, or *float32*)

Simulation parameters

- Simulation output must be set to *steps* to enable the generation of steps in simulation.
- Step times (vectorizable) specifies the time points when the steps occur (in seconds).
- Data points (vectorizable) specifies the steps to perform at each defined time point.

The tunable parameters can also be altered through the CAN bus similar to a [CAN input mailbox](#) or via UDP/IP, similar to an [Ethernet input mailbox](#).



The image shows a MATLAB/Simulink dialog box titled "Block Parameters: imperix_template/code b/Tunab...". It contains a description of the "Tunable parameter (mask) (link)" block, which "Creates a variable that can be watched and altered in real-time using the Cockpit utility software." Below the description are tabs for "Variable", "Simulation", "CAN", and "Ethernet (UDP)". The "Variable" tab is active, showing fields for "Variable name:" (param_name), "Initial value(s):" (0), "Signal type:" (float32), "Upper limit (inf for unlimited):" (inf), and "Lower limit (-inf for unlimited):" (-inf). Each field has a checkbox to its right. At the bottom are buttons for "OK", "Cancel", "Apply", and "Help".

Block Parameters: imperix_template/code b/Tunab... X

Tunable parameter (mask) (link)

Creates a variable that can be watched and altered in real-time using the Cockpit utility software.

Variable Simulation CAN Ethernet (UDP)

Variable name:

param_name literal ☐

Initial value(s):

0 ☐

Signal type:

float32 ☐

Upper limit (inf for unlimited):

inf ☐

Lower limit (-inf for unlimited):

-inf ☐

OK Cancel Apply Help

Block Parameters: imperix_template/code b/Tunab... X

Tunable parameter (mask) (link)

Creates a variable that can be watched and altered in real-time using the Cockpit utility software.

Variable Simulation CAN Ethernet (UDP)

Simulation:

Steps ☐

Step time(s):

[1 2] ☐

Data point(s):

[0 1] ☐

OK Cancel Apply Help

Block Parameters: imperix_template/code b/Tunab... X

Tunable parameter (mask) (link)

Creates a variable that can be watched and altered in real-time using the Cockpit utility software.

Variable Simulation CAN Ethernet (UDP)

Enable CAN:

Enabled ☐

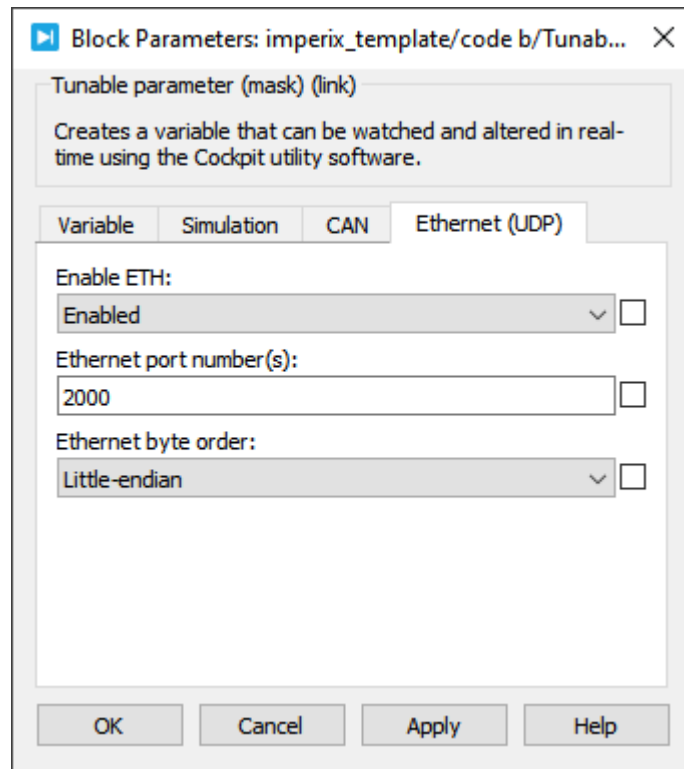
CAN address(es):

0 ☐

CAN byte order:

Little-endian ☐

OK Cancel Apply Help



C++ functions

All global variables of type `int`, `unsigned int`, or `float` can be scoped and altered using the BB Control utility software.

Data can be received using the [Ethernet input mailbox](#) or the [CAN input mailbox](#).