Simulink Report: HR_Conv_Thermal_Capacity_

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Model - HR_Conv_Thermal_Capacity_

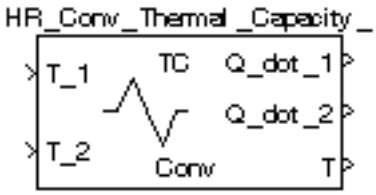


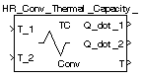
Tabelle 1.1. HR_Conv_Thermal_Capacity_ Simulation Parameters

Solver ode14x	*ZeroCross* on	*StartTime* 0.0*StopTime* 10.0
RelTol 1e-3	*AbsTol* auto	*Refine* 1
InitialStep auto	*FixedStep* auto	*MaxStep* auto

Tabelle 1.2. HR_Conv_Thermal_Capacity_ Summary Information

NumModelInputs	N/A	*NumModelOutputs*	N/A
NumVirtualSubsystems	N/A	*NumNonvirtSubsystems*	N/A
NumNonVirtBlocksInModel	N/A	*NumBlockTypeCounts*	N/A
NumBlockSignals	N/A	*NumBlockParams*	N/A
NumZCEvents	N/A	*NumNonsampledZCs*	N/A

Systems

Name	Parent	Snapshot	Blocks	Signals
HR_Conv_Thermal_Capacity_	<root>		HR_Conv_Thermal_Capacity_	HR_Conv_Thermal_Capacity_<1> HR_Conv_Thermal_Capacity_<2> HR_Conv_Thermal_Capacity_<3>

Blocks

Tabelle 1.3. Block Type Count

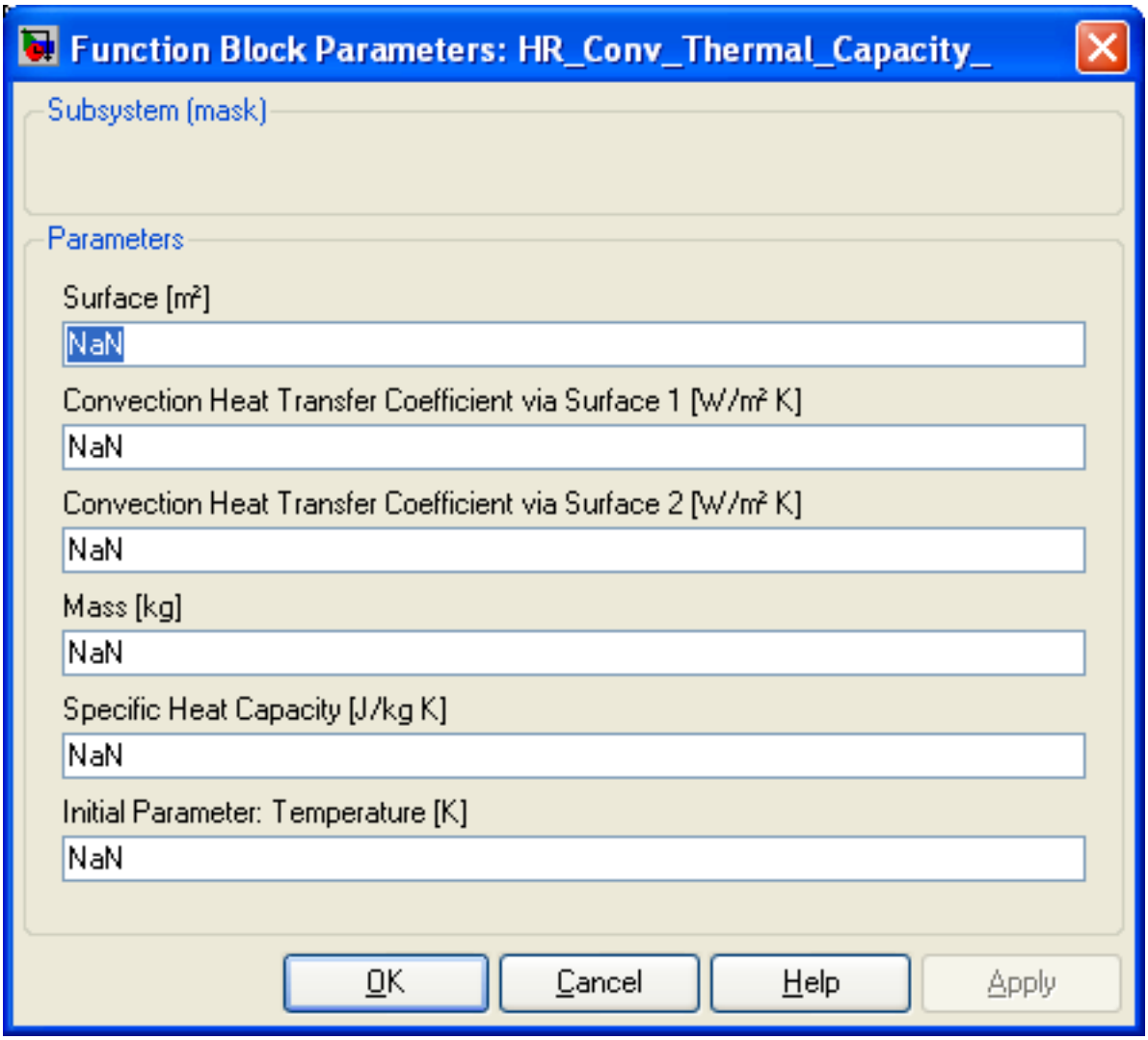
BlockType	Count	Block Names
Inport	10	T_1, T_2, A, m, c, alpha_1, alpha_2, T, T_1, T_2
Outport	6	Q_dot_1, Q_dot_2, d_T, Q_dot_1, Q_dot_2, T

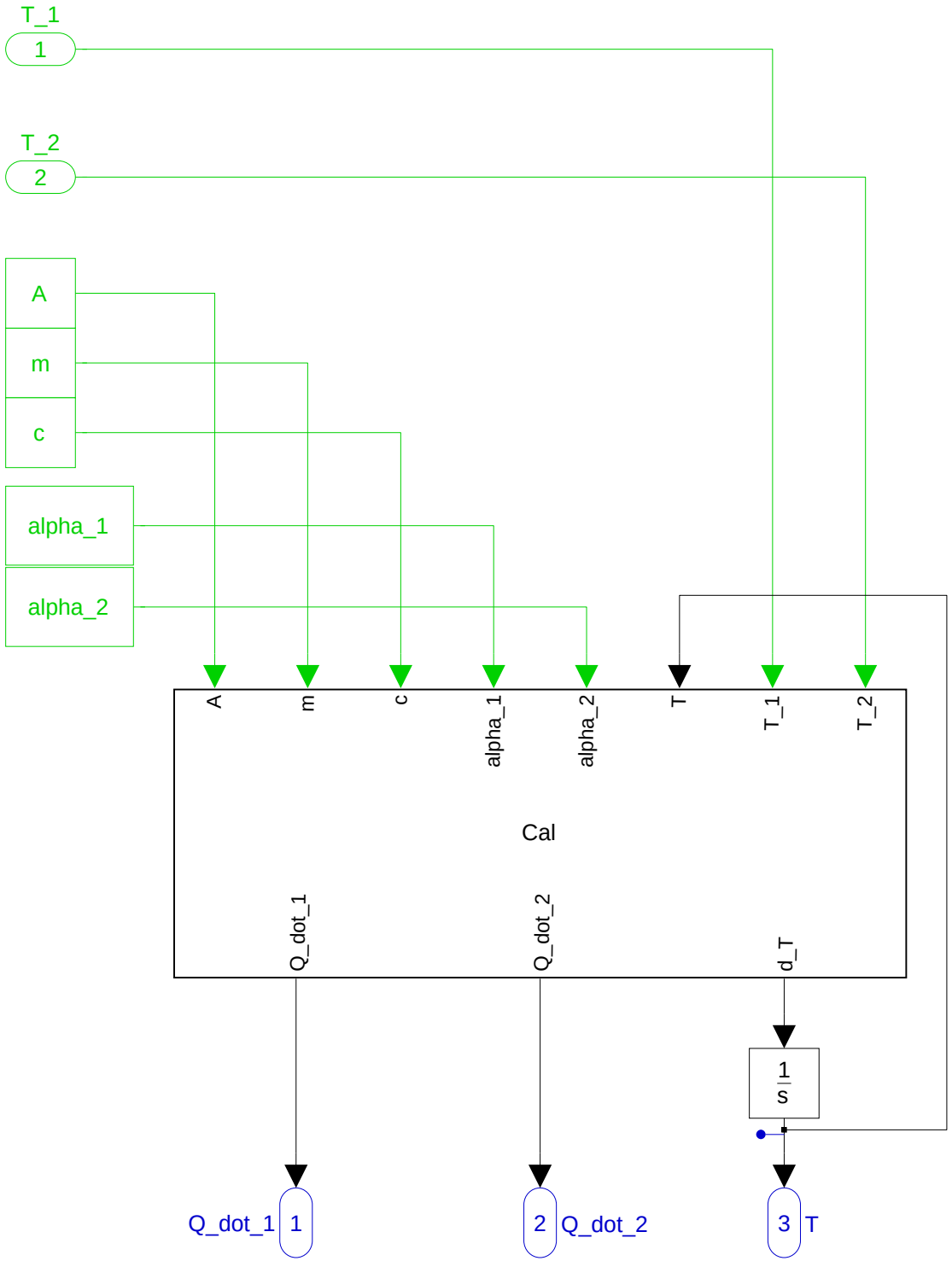
BlockType	Count	Block Names
Constant	5	A, alpha_1, alpha_2, c, m
Terminator	1	Terminator
SubSystem	1	HR_Conv_Thermal_Capacity_
Stateflow (m)	1	Embedded MATLA Function
S-Function	1	SFunction
Integrator	1	Integrator
Demux	1	Demux

Data and Functions

Tabelle 1.4. Model Functions

Function Name	Parent Blocks	Calling string
NaN		
	HR_Conv_Thermal_Capacity_	`NaN`
	HR_Conv_Thermal_Capacity_	`NaN`
	HR_Conv_Thermal_Capacity_	`NaN`
	HR_Conv_Thermal_Capacity_	`NaN`
	HR_Conv_Thermal_Capacity_	`NaN`
	HR_Conv_Thermal_Capacity_	`NaN`


Function Block Parameters: HR_Conv_Thermal_Capacity_
Subsystem (mask)
Parameters
Surface [m²]
NaN
Convection Heat Transfer Coefficient via Surface 1 [W/m² K]
NaN
Convection Heat Transfer Coefficient via Surface 2 [W/m² K]
NaN
Mass [kg]
NaN
Specific Heat Capacity [J/kg K]
NaN
Initial Parameter: Temperature [K]
NaN
OK
Cancel
Help
Apply


T_1
1
T_2
2
A
m
c
alpha_1
alpha_2
A
m
c
alpha_1
alpha_2
T
T_1
T_2
Cal
Q_dot_1
Q_dot_2
d_T
1
s
Q_dot_1
1
2
Q_dot_2
3
T

```
function [Q_dot_1,Q_dot_2,d_T] = Cal(A,m,c,alpha_1,alpha_2,T,T_1,T_2)

% ************************************************************************
% * Definition of a Heat Resistance + Thermal Capacity
% *
% * Number of inputs:                                                  2
% *
% * Parameter: Surface:                                                A
% *            Mass wall:                                              m
% *            Specific heat capacity wall:                            c
% *            Convection heat transfer coefficient via surface 1: alpha_1
% *            Convection heat transfer coefficient via surface 2: alpha_2
% *
% *
% * Relevant input variables of HR+TC
% *
% * Temperature:                                                       T_in
% *
% *
% * Relevant output variables of HR+TC
% *
% * Heat flow:                                                         Q_dot
% *
% ************************************************************************
% * Embedded Matlab Function Cal:
% *
% * Calculations:
% * 1. Calculation heat flow.
% * 2. Modification of the temperature.
% *
% *
% * Assumptions:
% * 1. Heat Transfer process = convection
% *
% *
% * Last modification : 15.03.2008
% * Author : Christian Müller(HAW)
% *
% ************************************************************************

% * 1. Calculation heat flow
Q_dot_1 = -alpha_1*A*(T_1-T);
Q_dot_2 = -alpha_2*A*(T_2-T);
% ************************************************************************

% * 2. Modification of the temperature
d_T     = -(Q_dot_1+Q_dot_2)/(m*c)
% ************************************************************************
```