

Supporting Information

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Section S-1. Description of the get functions

The DLL toolkit comprises 10 get functions (listed in Table 5) that allow the users to obtain the properties of the DEBs and access the simulation results of both EPANET and WUDESIM. All the get functions take one or more input arguments of the type `int`. Each get function takes a combination of five possible input arguments that are listed in table S-1 together with their descriptions.

Table S-1. Input arguments of the get functions

Input Argument	Description
<code>prop_idx</code>	Index of the property/result that the user wishes to obtain. Takes different options for each function
<code>branch_idx</code>	Index of the branch that the user wishes to obtain the property/result of
<code>pipe_idx</code>	Index of the pipe that the user wishes to obtain the property/result of
<code>node_idx</code>	Index of the node that the user wishes to obtain the property/result of
<code>step</code>	Time step for which the user wishes to obtain the property/result

All get functions return a single output that could either have one of the following types: `int`, `double`, and `char*`, depending on the function. The specific input arguments taken by each get function together with the possible outputs returned by each get function are described below:

Function: DE_GET_BRAN_COUNT

Return type: `int`

Input Arguments: `prop_idx`

`prop_idx` options:

Value	Keyword	Description
0	DE_BRAN_COUNT	Returns the number of dead-end branches in the network

Function: DE_GET_STEP_COUNT

Return type: `int`

Input Arguments: `prop_idx`

`prop_idx` options:

Value	Keyword	Description
0	DE_EPANET_STEP_COUNT	Returns the number of EPANET simulation steps
1	DE_STOCHASTIC_STEP_COUNT	Returns the number of stochastically-generated demand steps

Function: DE_GET_BRAN_SIZE

Return type: int

Input Arguments: prop_idx, branch_idx

prop_idx options:

Value	Keyword	Description
0	DE_BRAN_SIZE	Returns the size of the dead-end branch

Function: DE_GET_PIPE_PROPERTY

Return type: double

Input Arguments: prop_idx, branch_idx, pipe_idx

prop_idx options:

Value	Keyword	Description
0	DE_LENGTH	Returns the length of the pipe
1	DE_DIAMETER	Returns the diameter of the pipe

Function: DE_GET_PIPE_RESULT_EPANET

Return type: double

Input Arguments: prop_idx, branch_idx, pipe_idx, step

prop_idx options:

Value	Keyword	Description
0	DE_REYNOLDS_EPANET	Returns the Reynolds number simulated by EPANET
1	DE_RES_TIME_EPANET	Returns the residence time (sec) simulated by EPANET
2	DE_FLOW_EPANET	Returns the flow (m ³ /sec) simulated by EPANET

Function: DE_GET_PIPE_RESULT_WUDESIM

Return type: double

Input Arguments: prop_idx, branch_idx, pipe_idx, step

prop_idx options:

Value	Keyword	Description
0	DE_REYNOLDS_WUDESIM	Returns the Reynolds number simulated by WUDESIM
1	DE_RES_TIME_WUDESIM	Returns the residence time (sec) simulated by WUDESIM
2	DE_PECLET_WUDESIM	Returns the Peclet number simulated by WUDESIM

Function: DE_GET_NODE_RESULT_EPANET

Return type: double

Input Arguments: prop_idx, branch_idx, node_idx, step

prop_idx options:

Value	Keyword	Description
0	DE_QUAL_EPANET	Returns the water quality simulated by EPANET
1	DE_DEMAND_EPANET	Returns the water demand (m ³ /sec) simulated by EPANET

Function: DE_GET_NODE_RESULT_WUDESIM

Return type: double

Input Arguments: prop_idx, branch_idx, node_idx, step

prop_idx options:

Value	Keyword	Description
0	DE_QUAL_WUDESIM	Returns the water quality simulated by WUDESIM

Function: DE_GET_STOC_FLOW

Return type: double

Input Arguments: prop_idx, branch_idx, pipe_node_idx, step

prop_idx options:

Value	Keyword	Description
0	DE_FLOW_STOCHASTIC	Returns the stochastically generated flow for a pipe
1	DE_DEMAND_STOCHASTIC	Returns the stochastically generated demand for a node

Function: DE_GET_ID

Return type: char*

Input Arguments: prop_idx, branch_idx, pipe_node_idx

prop_idx options:

Value	Keyword	Description
0	DE_PIPE_ID	Returns the ID of a pipe
1	DE_NODE_ID	Returns the ID of a node
2	DE_BRAN_ID	Returns the ID of branch