Proposed Changes to 61970 ACLineSegment modeling for mutual coupling

From the Device Datasheet Breakout Group

30 January, 2022

Changes to UML classes, attributes, and associations

61970 changes

Add class LineSegmentCoupling, a child of IdentifiedObject

with attributes

.coupledLineNumber

.reverseFlow

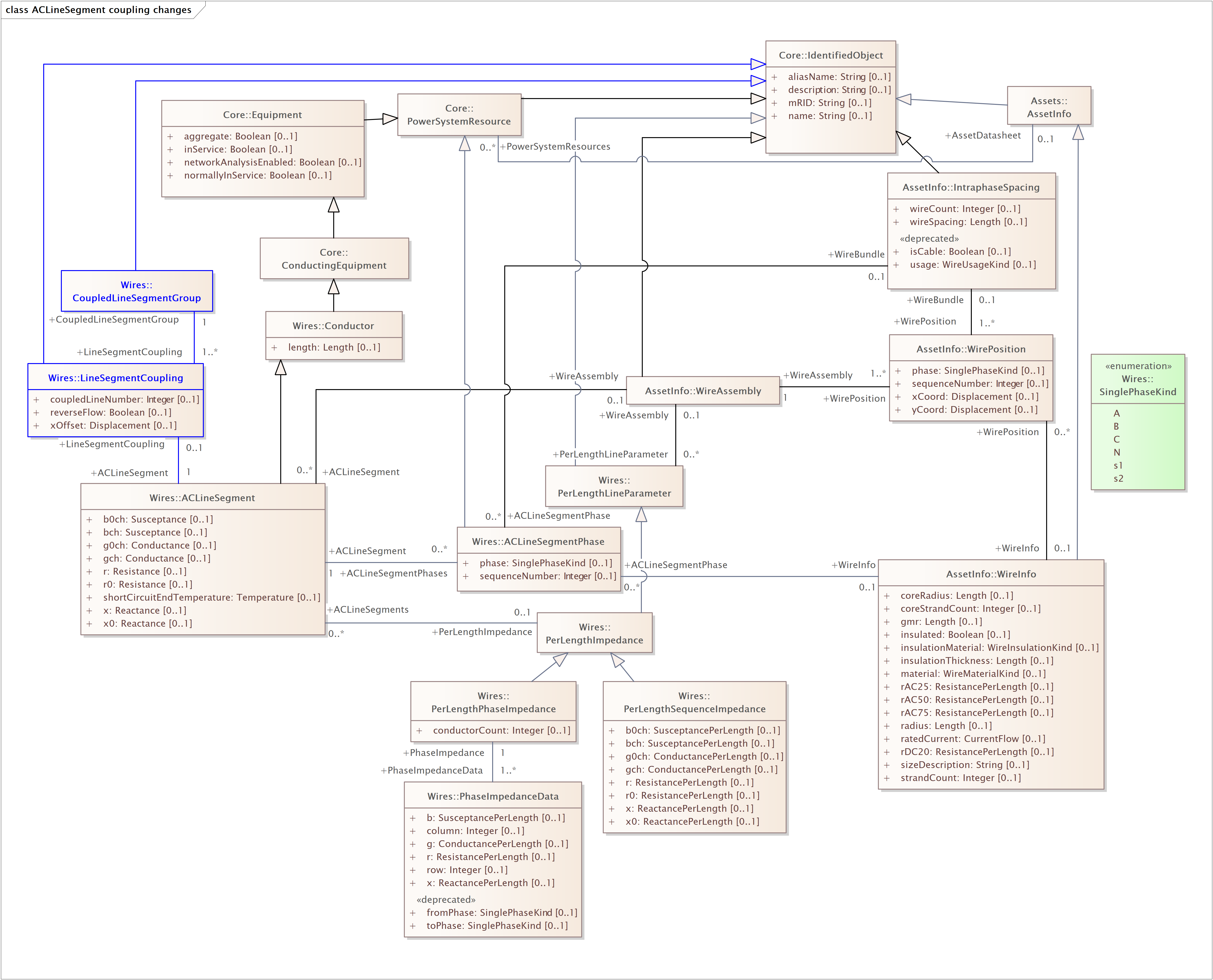
.xOffset

Add class CoupledLineSegmentGroup, a child of IdentifiedObject

with no attributes

Add association LineSegmentCoupling.ACLineSegment

Add association LineSegmentCoupling.CoupledLineSegmentGroup



Changes to UML descriptions

*Associations*

## LineSegmentCoupling to ACLineSegment association

SOURCE LineSegmentCoupling

Role: LineSegmentCoupling

The description of this line's coupling with other lines in a coupled group.

Multiplicity: [0..1]

TARGET ACLineSegment

Role: ACLineSegment

The line whose relationship in a coupled group is described.

Multiplicity: [1]

## LineSegmentCoupling to CoupledLineSegmentGroup

SOURCE LineSegmentCoupling

Role: LineSegmentCoupling

A coupled line in this coupled group of lines.

Multiplicity: [1..\*]

TARGET CoupledLineSegmentGroup

Role: CoupledLineSegmentGroup

The coupled group of lines with which this coupled line has relationships.

Multiplicity: [1]

*Classes and Attributes*

## LineSegmentCoupling

Class in package 'Wires'

Describes the relationship of a line in a coupled group to the reference line in the group. (Reference line has a coupledLineNumber = 1.)

| ATTRIBUTES |
| --- |
| coupledLineNumber : Integer Public  Multiplicity: [0..1]  Sequence number of coupled line. Value of 1 indicates that line is the reference line. Valid value range is from 1 to number of coupled lines in the group. |
| reverseFlow : Boolean Public  Multiplicity: [0..1]  Indication of whether the reference end of a line in a coupled group is the same as the reference end of the reference line.  Set reverseFlow to True for any lines that don’t have their Terminal with sequenceNumber = 1 at the same end as the reference line.  Set reverseFlow to False for the reference line and for any lines that have their Terminal with sequenceNumber = 1 at the same end as the reference line.  The sign of the coupled voltage drop of an ACLineSegment reverses when two coupled lines have their Terminals with sequenceNumber = 1 at opposite ends. |
| xOffset : Displacement Public  Multiplicity: [0..1]  The horizontal offset between the horizontal reference point of a coupled line and the horizontal reference point of the reference line in the group.  The horizontal reference point for a line is established by the line's WireAssembly. It is the zero x position on which the xCoord values of WirePositions in the WireAssembly are based. |

## CoupledLineSegmentGroup

Class in package 'Wires'

Aggregates a set of line segments that are on the same tower, or in the same right-of-way, close enough that mutual coupling impedances between the lines need to be included in network analysis.