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# Classes

## AirInterfaceCapability

Describes the 'analog' capabilities of modem and transmitter of the microwave device. Value ranges of attributes are not independently (e.g. min. and max. transmit power depends on modulation). Legal combinations of values are expressed in transmissionModeTypes.

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterfaceCapability

Table 1: Attributes for AirInterfaceCapability

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| typeOfEquipment | String  Type of equipment not yet defined. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | This parameter indicates the equipment type. Instead of uploading the complete set of capabilities, capabilities of the same equipment type could be reused. Should be unique for a combination of modem, radio and their respective firmware. |
| txFrequencyMin | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Value of the minimum transmit frequency tunable at the air interface. |
| txFrequencyMax | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Value of the maximum transmit frequency tunable at the air interface. |
| rxFrequencyMin | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Value of the minimum receive frequency tunable at the air interface. |
| rxFrequencyMax | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Value of the maximum receive frequency tunable at the air interface. |
| duplexDistanceIsFreelyConfigurable | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = Transmitted and received frequency can be freely chosen between the given minimum and maximum values. |
| duplexDistanceList | Integer  -1 | 0..\* | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Only relevant if (duplexDistanceIsFreelyConfigurable==false). Lists all supported distances between transmitted and received frequency. |
| \_transmissionModeList | TransmissionMode  ./. | 1..\* | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | List of supported Transmission Modes. |
| autoFreqSelectIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | In case the microwave radio is capable of automatically selecting the transmit frequency in unlicensed bands, this field shall contain a 'true'. |
| receiverOnOffIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | In case switching on/off the receiver is available at the device, this field shall contain a 'true'. |
| adaptiveModulationIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | In case the device is capable of adaptive modulation, this field shall contain a 'true'. |
| atpcIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | In case the microwave radio is capable of ATPC, this field shall contain a 'true'. |
| atpcRange | Integer  0 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dB  • support: MANDATORY | Extent of the ATPC range. This value represents a device specific maximum value. The actual range of the ATPC at a specific link might be limited by the difference between configured transmit power (AirInterface::AirInterfaceConfiguration::txPower) and minimum transmit power of the device (TypeDefinitions::TransmissionModeType::txPowerMin). |
| supportedRadioSignalIdDatatype | RadioSignalIdDatatypeType  NOT\_YET\_DEFINED | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | This attribute is for expressing the datatype, which is supported as a Radio Signal ID by the device. |
| supportedRadioSignalIdLength | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If (supportedRadioSignalIdDatatype==INTEGER): Maximum value of the Radio Signal ID supported by the device; If (supportedRadioSignalIdDatatype==STRING): Maximum number of letters supported by the device. |
| expectedEqualsTransmittedRadioSignalID | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = It is not possible to configure an expectedRadioSignalID different from the transmittedRadioSignalID. |
| encryptionIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Shall be marked 'true', if payload encryption is available. |
| supportedLoopBackKindList | LoopBackType  ./. | 1..4 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | List of supported kinds of looping back of header information to the remote site. |
| maintenanceTimerRange | String  Range of the maintenance timer not yet defined. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Available time periods for maintenance configurations (e.g. the loop back of microwave header information) to be described. Concrete values shall be separated by commas (e.g. '10, 60, 360'). Ranges shall be expressed as two values separated by a minus (e.g. '10-360'). |
| acmThresholdCrossAlarmsIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = Threshold cross alarms on performance of adaptive code modulation are available. |
| clearingThresholdCrossAlarmsIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = Clearing threshold cross alarms by calling clearThresholdCrossAlarms() operation is available at the device. |
| performanceMonitoringIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = Collection and aggregation of performance values is available. |
| directionOfAcmPerformanceValues | DirectionType  NONE | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Expresses, whether the ACM performance values (timeXStatesList) are measured at the transmitter (TX) or at the receiver (RX). |

## AirInterfaceConfiguration

Configuration of the radio link.

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterfaceConfiguration

Table 2: Attributes for AirInterfaceConfiguration

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| airInterfaceName | String  Air interface ID not yet defined. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Operator specific microwave link ID (often used for coding area, type of element and sequential number). |
| remoteAirInterfaceName | String  Air interface ID at the remote site not yet defined. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Name of the air interface, which belongs to the same link, at the remote site. |
| transmittedRadioSignalID | RadioSignalIdType  ./. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Transmitted radio signal ID for synchronizing the remote receiver. |
| expectedRadioSignalID | RadioSignalIdType  ./. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Only relevant, if expectedEqualsTransmittedRadioSignalID==false. Received radio signal ID for identifying the correct transmitter to synchronize on. |
| txFrequency | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Center frequency of the transmit channel. The values to be configured have to exactly match the values listed in the international agreement referenced in channelPlanID. In case of automated selection of the transmit frequency this field shall describe the lowest center frequency selectable. |
| rxFrequency | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Only configurable, if (duplexDistanceIsFreelyConfigurable==true). Allows configuring of the center frequency of the receive channel. |
| duplexDistance | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Only configurable, if (duplexDistanceIsFreelyConfigurable==false) AND (duplexDistanceList contains more than one value). Allows configuring one of the values represented in AirInterfaceCapability::duplexDistanceList. |
| \_transmissionModeMin | TransmissionMode  ./. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY  PassedByReference | Minimum transmission mode to be configured (in case adaptive modulation is not used, this value represents also the fixed transmission mode). |
| \_transmissionModeMax | TransmissionMode  ./. | 0..1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY  PassedByReference | Maximum transmission mode to be configured. |
| powerIsOn | Boolean  true | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = The power to all physical components required for this AirInterface instance is turned on. |
| transmitterIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activation of the transmitter inside the radio shall be expressed as a 'true'. |
| receiverIsOn | Boolean  true | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Maintenance Feature. Activation of the receiver inside the radio shall be expressed as a 'true'. Attribute shall also be used for RX main and RX diversity squelches in case of diversity configurations. |
| txPower | Integer  99 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Transmit power to be configured on the microwave link. Signed Byte is required. The actually operated transmit power might be lower depending on adaptive modulation and ATPC. |
| adaptiveModulationIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Adaptive Modulation. Activation of adaptive modulation shall be expressed as a 'true'. |
| xpicIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activation of Cross Polarization Interference Cancelation shall be expressed as a 'true'. In case XPIC is not available for the current combination of channel bandwidth and modulation or the hardware in general, this parameter shall always be set to 'false'. |
| mimoIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activation of Multiple Input Multiple Output (MIMO) shall be expressed as a 'true'. |
| alicIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activation of Adjacent Link Interference Cancelation (ALIC) shall be expressed as a 'true'. |
| atpcIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | ATPC. Activation of Automated Transmit Power Control shall be expressed as a 'true'. |
| atpcThreshUpper | Integer  99 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | If the receive level at the local/remote site is higher than the upper threshold value, the transmitter at the remote/local site is notified to decrease transmit power. In case the device does not know upper and lower threshold values, but only a single reference value, the atpcThreshUpper shall not be available for configuration and constantly represent the default value. |
| atpcThreshLower | Integer  99 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | If the receive level at the local/remote site is lower than the lower threshold value, the transmitter at the remote/local site is notified to increase transmit power. In case the device does not know upper and lower threshold values, but only a single reference value, the atpcThreshLower shall represent this reference value. |
| atpcTxPowerMin | Integer  -99 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Transmit power, which is not to be undercut, while operating ATPC. |
| autoFreqSelectIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activation of automatically selecting the transmit frequency in unlicensed bands shall be expressed as a 'true'. |
| autoFreqSelectRange | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: channels  • support: MANDATORY | Number of transmit channels (starting at the center frequency defined in txFrequency and with channel bandwidth according to txChannelBandwidth) that define the range within the transmit frequency can automatically been chosen. |
| modulationIsOn | Boolean  true | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Maintenance Feature. De-activation of the modulation of the carrier signal for fault management shall be expressed as a 'false'. |
| encryptionIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Activates encryption of the payload. |
| cryptographicKey | String  Cryptographic key not yet defined. | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Key for transforming plaintext into ciphertext data. |
| loopBackKindOn | LoopBackType  NONE | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Maintenance Feature. The currently configured type of looping back of the air interface header shall be expressed here. The received header is returned to the remote site. |
| maintenanceTimer | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: s  • support: MANDATORY | Time of existence of any maintenance configuration (e.g. the loop back of microwave header information). 0 = maintenance timer is switched off. Valid values are defined in AirInterface::AirInterfaceCapability::maintenanceTimerRange. |
| g826ThresholdCrossAlarmList | G826ThresholdCrossAlarmType  ./. | 0..\* | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | List of G826 related threshold cross alarms to be configured. |
| xltsThresholdCrossAlarmList | XltsThresholdCrossAlarmType  ./. | 0..\* | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | List of RLTS or TLTS (ETSI EN 301 129) related threshold cross alarms to be configured. |
| acmThresholdCrossAlarmList | AcmThresholdCrossAlarmType  ./. | 0..\* | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | List threshold cross alarms, which relate to the time period of operation of a specific transmission mode. |
| performanceMonitoringIsOn | Boolean  false | 1 | RW | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Enables measurement, collection, storage and access to performance data. |

## AirInterfaceCurrentPerformance

Aggregated performance information of the air interface at a particular moment.

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterfaceCurrentPerformance

Table 3: Attributes for AirInterfaceCurrentPerformance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| currentPerformanceDataList | AirInterfaceCurrentPerformanceType  ./. | 1..2 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | At least values of the counters, which are reset every 15 minutes, are to be provided. If available, the current values of the counters, which are reset every 24 hour, can be provided, too. |
| numberOfCurrentPerformanceSets | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Number of sets of current performance values, which are provided in the list. |

## AirInterfaceHistoricalPerformances

Aggregated performance information of the air interface for a pre-defined measurement interval.

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterfaceHistoricalPerformances

Table 4: Attributes for AirInterfaceHistoricalPerformances

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| historicalPerformanceDataList | AirInterfaceHistoricalPerformanceType  ./. | 0..\* | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY |  |
| numberOfHistoricalPerformanceSets | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Number of sets of historical performance values, which are provided in the list. |
| timeOfLatestChange | DateTime  2010-11-20T14:00:00+01:00 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Date and time when the list of sets of historical performance values has been changed for the last time (e.g. new one added or existing one deleted). |

## AirInterfaceLpSpec

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: YES
* objectDeletionNotification: YES

Attributes for AirInterfaceLpSpec

Table 5: Attributes for AirInterfaceLpSpec

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| \_airInterface\_Pac | AirInterface\_Pac  ./. | 1 | RW | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |

## AirInterfaceStatus

Measurements of current values on the air interface and operational status of the device.

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterfaceStatus

Table 6: Attributes for AirInterfaceStatus

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| interfaceStatus | InterfaceStatusType  NOT\_YET\_DEFINED | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Operational status of the interface. |
| txFrequencyCur | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Center frequency of the currently operated transmit channel. |
| rxFrequencyCur | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Center frequency of the currently operated receive channel. |
| \_transmissionModeCur | TransmissionMode  ./. | 0..1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY  PassedByReference | Currently operated transmission mode according to definitions in Capabilities. |
| receivedRadioSignalID | RadioSignalIdType  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Radio signal ID of the signal, which the receiver is currently synchronized on. |
| linkIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If connection is established to the remote site with the same linkID, this shall be expressed as a 'true'. |
| xpicIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If XPIC is currently actually working (not just configured), this shall be expressed as a 'true'. |
| mimoIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If MIMO is currently actually working (not just configured), this shall be expressed as a 'true'. |
| alicIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If Adjacent Link Interference Cancelation (ALIC) is currently actually working (not just configured), this shall be expressed as a 'true'. |
| atpcIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If ATPC is currently actually working (not just configured), this shall be expressed as a 'true'. |
| autoFreqSelectIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | If automated frequency selection is currently actually working (not just configured), this shall be expressed as a 'true'. |
| localEndPointId | String  not-supported | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | The value of the localEndPointId is a vendor specific identifier of the air interface, used by the node to discover a microwave radio link. |
| remoteEndPointId | String  not-supported | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | The value of the remoteEndPointId is a vendor specific identifier of the airinterface at the remote side, used to by the node to discover a microwave radio link. |
| loopBackKindUp | LoopBackType  NONE | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | The currently active (not just configured) type of looping back of the air interface header shall be expressed here. The received header is returned to the remote site. |
| performanceMonitoringIsUp | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: YES  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = Performance values are currently collected and aggregated. |
| rxLevelCur | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Current receive level. |
| txLevelCur | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Current transmit level. |
| snirCur | Integer  -99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dB  • support: MANDATORY | Currently measured signal to (noise+interference) ratio. |
| xpdCur | Integer  -99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: dB  • support: MANDATORY | Currently measured cross polarization discrimination. |
| rfTempCur | Integer  -99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: false  • valueRange: no range constraint  • unit: Celsius  • support: MANDATORY | Current temperature (in degree Celsius) of the radio module inside the outdoor unit. |

## AirInterface\_Pac

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for AirInterface\_Pac

Table 7: Attributes for AirInterface\_Pac

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| \_airInterfaceCapability | AirInterfaceCapability  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |
| \_airInterfaceConfiguration | AirInterfaceConfiguration  ./. | 1 | RW | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |
| \_airInterfaceStatus | AirInterfaceStatus  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |
| \_airInterfaceCurrentPerformance | AirInterfaceCurrentPerformance  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |
| \_airInterfaceHistoricalPerformances | AirInterfaceHistoricalPerformances  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | See referenced class |

## CurrentPerformance

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for CurrentPerformance

Table 8: Attributes for CurrentPerformance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| timestamp | DateTime  2010-11-20T14:00:00+01:00 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | The timestamp associated with when the current data was collected. |
| suspectIntervalFlag | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | This attribute is used to indicate that the performance data for the current period may not be reliable. Some reasons for this to occur are: - Suspect data were detected by the actual resource doing data collection. - Transition of the administrativeState attribute to/from the 'lock' state. - Transition of the operationalState to/from the 'disabled' state. - Scheduler setting that inhibits the collection function. - The performance counters were reset during the interval. - The currentData (or subclass) object instance was created during the monitoring period. |
| elapsedTime | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_64\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: s  • support: MANDATORY | Number of seconds that elapsed since the last reset of the counter. |
| scannerId | String  Scanner ID not defined. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY |  |
| granularityPeriod | GranularityPeriodType  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 1  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Time period between reset of the underlying counter. |

## HistoricalPerformance

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for HistoricalPerformance

Table 9: Attributes for HistoricalPerformance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| suspectIntervalFlag | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | This attribute indicates that the data collected during the interval is suspect. |
| historyDataId | String  History Data ID not defined. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY |  |
| granularityPeriod | GranularityPeriodType  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 1  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Time period between reset of the underlying counter. |
| periodEndTime | DateTime  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 2  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Time when the counter values have been recorded and the counter reset. |

## TransmissionMode

Applied stereotypes:

* OpenModelClass
* support: MANDATORY
* OpenInterfaceModelClass
* objectCreationNotification: NO
* objectDeletionNotification: NO

Attributes for TransmissionMode

Table 10: Attributes for TransmissionMode

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| transmissionModeName | String  ./. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 1  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Name of the transmission mode. BBBB-m\*-i\*/t\*-r\*. B=four digits of channel bandwidth in MHz. m\*=required number of digits for modulation name. (i\*/t\*=code rate.) i\*=required number of digits for number of information bits. t\*=required number of digits for total bits. r\*=required number of digits for rate reduction factor. Example: 0028-4QAM-188/204-1 |
| transmissionModeRank | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Configuring adaptive modulation by selecting \_transmissionModeMin and \_transmissionModeMin requires the transmission modes to be ordered. The vendor shall rank all available transmission modes according to the respective payload data rate. The application providers shall order the transmission modes according to the rank. |
| channelBandwidth | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_32\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: kHz  • support: MANDATORY | Bandwidth of the transmit channel. The value shall be expressed explicitly (means in kHz) not as a reference to an international agreement. The values shall be chosen from the following \_list: 3.500, 7.000, 14.000, 27.500, 28.000, 29.000, 29.650, 30.000, 40.000, 50.000, 55.000, 56.000, 59.300, 60.000, 80.000, 100.000, 112.000, 120.000, 150.000, 200.000, 250.000, 500.000, 750.000, 1.000.000, 1.250.000, 1.500.000, 1.750.000, 2.000.000; |
| modulationScheme | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: symbols  • support: MANDATORY | Modulation scheme, which is base to the other characteristics described in the same transmissionModeType data type. The modulation scheme shall be described by the number of states in the phase diagram (e.g. BPSK->'2' or 256QAM->'256'). |
| codeRate | Integer  -1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: %  • support: MANDATORY | Code rate of the coding scheme in % (Net bit rate is either smaller or equal to (Gross bit rate mulitplied with code rate) ). |
| symbolRateReductionFactor | Integer  1 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Reduction factor for the symbol rate. Example: value would be 4 for 1/4BPSK. |
| txPowerMin | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Value of the minimum transmit power the modem can operate in dBm. |
| txPowerMax | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Value of the maximum transmit power the modem can operate in dBm. |
| rxThreshold | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_16\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Value of the receive level required to decode the received signal with a Bit Error Rate of 1e-6 or less. |
| amUpshiftLevel | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Value of the receive level that has to be exceeded to shift into a higher modulation scheme. |
| amDownshiftLevel | Integer  99 | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: LENGTH\_8\_BIT  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: dBm  • support: MANDATORY | Value of the receive level that has to be exceeded for not shifting into a lower modulation scheme. |
| xpicIsAvail | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | In case this transmission mode is capable of XPIC, this attribute shall contain a 'true' value. This information shall strictly relate to the capability of setting an administrative state (xpic-is-on attribute could be configured to have a 'true' value) and is independent of a potential instantaneous operational status change. For example, this attribute might contain a 'true' value, even if an additional cable would have been required to actually operate XPIC at a specific microwave link. |
| supportedAsFixedConfiguration | Boolean  false | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | true = This transmission mode is available for manual configuration when Adaptive Modulation is switched off. |
| modulationSchemeNameAtLct | String  Modulation scheme name not yet defined. | 1 | R | OpenInterfaceModelAttribute  • AVC: NO  • bitLength: NA  OpenModelAttribute  • partOfObjectKey: 0  • isInvariant: true  • valueRange: no range constraint  • unit: no unit defined  • support: MANDATORY | Modulation scheme name, which is together with the applied channel bandwidth identifying this transmission mode at the graphical user interface of the local craft terminal. |

# Data Types

## AcmThresholdCrossAlarmType

Attributes for AcmThresholdCrossAlarmType

Table 11: Attributes for AcmThresholdCrossAlarmType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| acmThresholdCrossAlarmDefinitionNumber | Integer  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 1 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Sequence number of the definitions. |
| \_transmissionMode | TransmissionMode  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: no unit defined * support: MANDATORY   PassedByReference |  |
| secondsForRaisingAlarm | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: s * support: MANDATORY | Number of seconds, in which the referenced transmission mode has to be operated until the threshold cross alarm is raised for this 15min or 24hour period. |
| secondsForClearingAlarm | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: s * support: MANDATORY | Number of seconds, in which the referenced transmission mode has to be operated until the threshold cross alarm is cleared for this 15min or 24hour period. |
| granularityPeriod | GranularityPeriodType  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 2 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Period of the performance data collection. |

## AirInterfaceCurrentPerformanceType

Turns performance information into current performance information by inheriting from OTN\_CurrentData.

Attributes for AirInterfaceCurrentPerformanceType

Table 12: Attributes for AirInterfaceCurrentPerformanceType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| performanceData | AirInterfacePerformanceType  ./. | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY |  |

## AirInterfaceHistoricalPerformanceType

Turns performance information into historical performance information by inheriting from OTN\_HistoryData.

Attributes for AirInterfaceHistoricalPerformanceType

Table 13: Attributes for AirInterfaceHistoricalPerformanceType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| performanceData | AirInterfacePerformanceType  ./. | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY |  |

## AirInterfacePerformanceType

Consolidated performance information of the air interface.

Attributes for AirInterfacePerformanceType

Table 14: Attributes for AirInterfacePerformanceType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| es | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Number of errored seconds. |
| ses | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Number of severely errored seconds. |
| cses | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Number of consecutive severely errored seconds. |
| unavailability | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Total time of unavailability in seconds. |
| txLevelMin | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Minimum transmit power. Signed integers are required. |
| txLevelMax | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Maximum transmit power. Signed integers are required. |
| txLevelAvg | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Averaged transmit power. Signed integers are required. |
| rxLevelMin | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Minimum receive level. Signed integers are required. |
| rxLevelMax | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Maximum receive level. Signed integers are required. |
| rxLevelAvg | Integer  99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dBm * support: MANDATORY | Averaged receive level. Signed integers are required. |
| timeXStatesList | TimeXStatesType  ./. | 1..\* | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Time period the transmitter operated in the respective transmission mode. |
| snirMin | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Minimum signal to (noise+interference) ratio. |
| snirMax | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Maximum signal to (noise+interference) ratio. |
| snirAvg | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Averaged signal to (noise+interference) ratio. |
| xpdMin | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Minimum cross polarization discrimination. |
| xpdMax | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Maximum cross polarization discrimination. |
| xpdAvg | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: dB * support: MANDATORY | Averaged cross polarization discrimination. |
| rfTempMin | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: Celsius * support: MANDATORY | Lowest temperature (in degree Celsius) of the radio module inside the outdoor unit. |
| rfTempMax | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: Celsius * support: MANDATORY | Highest temperature (in degree Celsius) of the radio module inside the outdoor unit. |
| rfTempAvg | Integer  -99 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: Celsius * support: MANDATORY | Averaged temperature (in degree Celsius) of the radio module inside the outdoor unit. |
| defectBlocksSum | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_16\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: blocks * support: MANDATORY | Total number of blocks that were defect after receiving and could not be corrected by the FEC. |
| timePeriod | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Total length of the measurement period. |

## G826ThresholdCrossAlarmType

Allows defining a threshold cross alarm.

Attributes for G826ThresholdCrossAlarmType

Table 15: Attributes for G826ThresholdCrossAlarmType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| g826ValueKind | G826Type  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 1 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Kind of performance value that shall be equipped with a threshold alarm. |
| alarmRaisingThreshold | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: s * support: MANDATORY | Number of events required for raising the threshold cross alarm. |
| alarmClearingThreshold | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: s * support: MANDATORY | Number of events required for clearing the threshold cross alarm. |
| granularityPeriod | GranularityPeriodType  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 2 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Period of the performance data collection. |

## RadioSignalIdType

Attributes for RadioSignalIdType

Table 16: Attributes for RadioSignalIdType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| numericRadioSignalID | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Only relevant if (supportedRadioSignalIdDatatype==INTEGER): 0 = the receiver ignores the signal ID of the received signal. Any other value = the receiver exclusively synchronizes on signals with the same signal ID. -1 = to be used, if numericRadioSignalID is not supported or for expectedRadioSignalID, if it has to equal transmittedRadioSignalID. |
| alphanumericRadioSignalID | String  Not yet defined. | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Only relevant if (supportedRadioSignalIdDatatype==STRING): Empty String = the receiver synchronizes on the received signal regardless of the signal ID of the received signal. Any other entry = the receiver exclusively synchronizes on signals with the same signal ID. Not yet defined. = to be used, if alphanumericRadioSignalID is not supported or for expectedRadioSignalID, if it has to equal transmittedRadioSignalID. |

## TimeXStatesType

Attributes for TimeXStatesType

Table 17: Attributes for TimeXStatesType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| timeXStateSequenceNumber | Integer  ./. | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 1 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Sequence number of the performance value. |
| \_transmissionMode | TransmissionMode  ./. | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY   PassedByReference | Operated transmission mode. |
| time | Integer  -1 | 1 | R | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: true * valueRange: no range constraint * unit: s * support: MANDATORY | Sum of all seconds the transmitter operated the transmission mode. |

## XltsThresholdCrossAlarmType

Attributes for XltsThresholdCrossAlarmType

Table 18: Attributes for XltsThresholdCrossAlarmType

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute Name** | **Type** | **Multiplicity** | **Access** | **Stereotypes** | **Description** |
| levelThresholdSecondKind | XLevelThresholdSecondKindType  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 1 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Defines whether receive (RLTS) or transmit (TLTS) level triggers the threshold cross alarm. |
| xltsLevel | Integer  99 | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: dBm * support: MANDATORY | If (LevelThresholdSecondKindType==RLTS): Receive level, which has to be undercut, for the performance counter incrementing the number of seconds. If (LevelThresholdSecondKindType==TLTS): Transmit level, which has to be exceeded, for the performance counter incrementing the number of seconds. See also ETSI EN 301 129 V1.1.2 (1999-05). |
| amountOfSeconds | Integer  -1 | 1 | RW | OpenInterfaceModelAttribute   * AVC: YES * bitLength: LENGTH\_32\_BIT   OpenModelAttribute   * partOfObjectKey: 0 * isInvariant: false * valueRange: no range constraint * unit: s * support: MANDATORY | Number of seconds, which has to be exceeded for causing the threshold cross alarm to raise for this period. |
| granularityPeriod | GranularityPeriodType  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: NA   OpenModelAttribute   * partOfObjectKey: 2 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Period of the performance data collection. |
| xltsThresholdCrossAlarmDefinitionNumber | Integer  ./. | 1 | RW | OpenInterfaceModelAttribute   * AVC: NO * bitLength: LENGTH\_8\_BIT   OpenModelAttribute   * partOfObjectKey: 3 * isInvariant: true * valueRange: no range constraint * unit: no unit defined * support: MANDATORY | Sequence number of the definitions. |

# Enumeration Types

## DirectionType

Contains Enumeration Literals:

* TX:
* RX:
* NONE:

## G826Type

Contains Enumeration Literals:

* ES:
  + Errored Seconds. Threshold cross alarm will relate to TypeDefinitions::AirInterfacePerformanceType::es .
* SES:
  + Severely Errored Seconds. Threshold cross alarm will relate to TypeDefinitions::AirInterfacePerformanceType::ses .
* CSES:
  + Consecutive Severely Errored Seconds. Threshold cross alarm will relate to TypeDefinitions::AirInterfacePerformanceType::cses .
* UAS:
  + Unavailable Seconds. Threshold cross alarm will relate to TypeDefinitions::AirInterfacePerformanceType::unavailability.
* NOT\_SPECIFIED:

## GranularityPeriodType

The enumeration with the options for granularity period of the performance data.

Contains Enumeration Literals:

* UNKNOWN:
* PERIOD-15-MIN:
* PERIOD-24-HOURS:
* NOT\_YET\_DEFINED:

## InterfaceStatusType

Current Interface Status

Contains Enumeration Literals:

* UP:
  + Ready to pass packets. It is expected that the LogicalTerminationPoint::operationalState attribute is expressing this logical layer being available for use (means: ENABLED), while this value occurs.
* DOWN:
  + The interface does not pass any packets. It is expected that the LogicalTerminationPoint::operationalState attribute is expressing this logical layer being NOT available for use (means: DISABLED), while this value occurs.
* TESTING:
  + In some test mode. No operational packets can be passed. It is expected that the LogicalTerminationPoint::operationalState attribute is expressing this logical layer being NOT available for use (means: DISABLED), while this value occurs.
* UNKNOWN:
  + Status cannot be determined for some reason. While this value occurs, the LogicalTerminationPoint::operationalState attribute, which is expressing the availability of the logical layer for being used, might have either ENABLED or DISABLED as value.
* DORMANT:
  + Waiting for some external event. It is expected that the LogicalTerminationPoint::operationalState attribute is expressing this logical layer being available for use (means: ENABLED), while this value occurs.
* NOT\_PRESENT:
  + Some component (typically hardware) is missing. It is expected that the LogicalTerminationPoint::operationalState attribute is expressing this logical layer being NOT available for use (means: DISABLED), while this value occurs.
* NOT\_YET\_DEFINED:
  + While this value occurs, the LogicalTerminationPoint::operationalState attribute, which is expressing the availability of the logical layer for being used, might have either ENABLED or DISABLED as value.

## LayerProtocolNameType

A controlled list of LayerProtocol names.

Contains Enumeration Literals:

* LAYER\_PROTOCOL\_NAME\_TYPE\_AIR\_LAYER:

## LoopBackType

Contains Enumeration Literals:

* RF\_TO\_REMOTE:
  + Returning the header information of the remote site back to the remote site on the radio interface between both outdoor units.
* RF\_TO\_LOCAL:
  + Returning the header information of the local site back to the local site on the radio interface between both outdoor units.
* IF\_TO\_REMOTE:
  + Returning the header information of the remote site back to the remote site on the intermediate frequency interface between local indoor unit and outdoor unit.
* IF\_TO\_LOCAL:
  + Returning the header information of the local site back to the local site on the intermediate frequency interface between local indoor unit and outdoor unit.
* NONE:

## RadioSignalIdDatatypeType

Contains Enumeration Literals:

* INTEGER:
* STRING:
* NOT\_YET\_DEFINED:

## XLevelThresholdSecondKindType

According to ETSI EN 301 129 V1.1.2 (1999-05) chapter B.1.1

Contains Enumeration Literals:

* RLTS:
* TLTS:
* NOT\_YET\_DEFINED: