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**HMS Common Inside Plant
Management Information Base(MIB)
SCTE-HMS-HE-RF-SWITCH-MIB**

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1. SCOPE

This document provides MIB definitions for HMS RF switch equipment present in the headend (or indoor) and is supported by a SNMP agent.

2. COPYRIGHT

The MIB definition found in this document may be incorporated directly in products without further permission from the copyright owner, SCTE.

3. NORMATIVE REFERENCE

IETF RFC 1907 SNMPv2-MIB
IETF RFC 2578 SNMPv2-SMI
IETF RFC 2579 SNMPv2-TC
IETF RFC 2580 SNMPv2-CONF
IETF RFC 2737 ENTITY-MIB
SCTE 36 SCTE-ROOT
SCTE 37 SCTE-HMS-ROOTS
SCTE 38-11 SCTE-HMS-HEADENDIDENT-MIB
SCTE 83-4 SCTE-HMS-HE-RF-MIB
SCTE 38-1 SCTE-HMS-HE-PROPERTY-MIB
SCTE 84-1 SCTE-HMS-HE-COMMON-MIB

4. INFORMATIVE REFERENCE

None

5. TERMS AND DEFINITIONS

This document defines the following terms:

Management Information Base (MIB) – the specification of information in a manner that allows standard access through a network management protocol.

6. REQUIREMENTS

This section defines the mandatory syntax of the SCTE-HMS-HE-RF-SWITCH-MIB. It follows the IETF Simple Network Management Protocol (SNMP) for defining managed objects.

The syntax is given below.

SCTE-HMS-HE-RF-SWITCH-MIB DEFINITIONS ::= BEGIN

IMPORTS

MODULE-COMPLIANCE, OBJECT-GROUP
FROM SNMPv2-CONF
OBJECT-TYPE, MODULE-IDENTITY, Unsigned32, Integer32
FROM SNMPv2-SMI
DisplayString
FROM SNMPv2-TC
entPhysicalIndex
FROM ENTITY-MIB
HeFaultStatus, HeTenthdB,
HeTenthdBmV, HeOnOffControl
FROM SCTE-HMS-HEADENDIDENT-MIB
heRFSwitchGroup
FROM SCTE-HMS-HE-RF-MIB;

heRFSwitchMIB MODULE-IDENTITY

LAST-UPDATED "200310090000Z" -- Oct 9, 2003
ORGANIZATION "SCTE HMS Working Group"
CONTACT-INFO
"SCTE HMS Subcommittee, Chairman
mailto: standards@SCTE.org"

DESCRIPTION

"The MIB module for the HMS HE RF Switch module entities.

This MIB module is for representing RF switch equipment present in the headend (or indoor) and is supported by a SNMP agent.

This MIB is limited in its scope and intended to describe an A-B (2 input and 1 output) or a crossbar RF switch. Up to 2 RF inputs and 2 outputs are supported. Any devices with more than 2 RF inputs or outputs shall be covered by another MIB.

This MIB does not intend to dictate all of the nuances involved in changing control settings (automatic or manual mode, changing switch controls in each possible mode combination). The most common desired behaviors are noted but specific switch operation and behavior are left to the RF switch vendors.

Not all control enumerations must be supported. This is noted in the variables that have optional enumerations.

Refer to the associated notes for information on what SNMP responses should be returned for unsupported enumerations."

::= { heRFSwitchGroup 1 }

heRFSwitchMIBObjects OBJECT IDENTIFIER ::= { heRFSwitchMIB 1 }

-- Every RF switch is modeled by the tables presented
 -- in this MIB module. These tables extend the entPhysicalTable
 -- according to RFC 2737. The extension index entPhysicalIndex uniquely
 -- identifies the RF switch.

-- Every RF switch is also modeled by the following tables:
 -- entPhysicalEntry - 1 row; (defined in document: RFC2737)
 -- heCommonEntry - 1 row. (defined in document: HMS111)

-- Every RF switch module will have its alarms modeled by the table:
 -- propertyEntry - x rows; (defined in document: HMS026)
 -- (where x is the nos. of alarmable analog properties supported
 -- by the RF switch)

-- discretePropertyEntry - y rows; (defined in document: HMS026)
 -- (where y is the nos. of alarmable digital properties supported by
 -- the RF switch)

-- Every RF switch module will have a list of currently active
 -- alarms modeled by the table:
 -- currentAlarmEntry - z rows; (defined in document: HMS026)
 -- (where z is the nos. of current active alarms in the RF
 -- switch)

-- Thus, an A-B RF switch (2 RF inputs and one RF output)
 -- will be represented by one row in entPhysicalTable, one row in
 -- heCommonTable, one row in heRFSwitchUnitTable, two rows in
 -- heRFSwitchInputTable and one row in heRFSwitchOutputTable.

-- Additionally, a crossbar RF switch (2 inputs and 2 outputs)
 -- will be represented by one row in entPhysicalTable, one row in
 -- heCommonTable, one row in heRFSwitchUnitTable, two rows
 -- in heRFSwitchInputTable and two rows in heRFSwitchOutputTable.

-- Correlation of outputs and inputs are indicated by the heRFSwitchState
 -- variable. Correlation of physical inputs and outputs to
 -- heRFSwitchInputTable and heRFSwitchOutputTables rows is indicated
 -- by the heRFSwitchInputDescription and heRFSwitchOutputDescription
 -- variables.

-- the RF Switch Unit Table
 heRFSwitchUnitTable OBJECT-TYPE
 SYNTAX SEQUENCE OF HeRFSwitchUnitEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "A table containing information about RF Switch used
 in an indoor environment."
 ::= { heRFSwitchMIBObjects 1 }

heRFSwitchUnitEntry OBJECT-TYPE
 SYNTAX HeRFSwitchUnitEntry

MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 >List of information about each RF switch."
 INDEX { entPhysicalIndex }
 ::= { heRFSwitchUnitTable 1 }

HeRFSwitchUnitEntry ::= SEQUENCE
 {
 heRFSwitchMode INTEGER,
 heRFSwitchControl INTEGER,
 heRFSwitchRevertEnable HeOnOffControl,
 heRFSwitchState INTEGER,
 heRFSwitchFailoverStatus HeFaultStatus,
 heRFSwitchBothInputStatus HeFaultStatus,
 heRFSwitchHysteresis HeTenthdB,
 heRFSwitchWaitToRestoreTime Integer32,
 heRFSwitchSensorMode INTEGER
 }

heRFSwitchMode OBJECT-TYPE
 SYNTAX INTEGER {
 automatic(1),
 manual(2)
 }
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "This controls and/or reports the switching mode. If
 automatic(1), the RF switch will evaluate the RF
 input status and make the decision to affect the switch state.
 If set to manual(2), the RF switch will not affect the
 switch state itself."
 ::= { heRFSwitchUnitEntry 1 }

heRFSwitchControl OBJECT-TYPE
 SYNTAX INTEGER {
 pathA(1),
 pathB(2),
 cross(3),
 bar(4),
 bothA(5),
 bothB(6)
 }
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "Sets the intended state of the RF Switch. The effect
 of this control will depend on the value of heRFSwitchMode.
 If heRFSwitchMode is set to automatic, the value this
 control is set to will be the preferred setting. If it is
 set to manual, the switch will assume this setting. Actual
 switch operation while changing switch control value(s)
 is up to the equipment vendor. For example, if the switch

is in manual mode and the operator tries to connect the output to an invalid input, the switch may or may not change state.

Not all enumerations must be supported. For example, an A-B RF switch may support only the pathA and pathB enumerations while a cross-bar switch may support cross, bar, bothA or bothB or only cross and bar but not pathA and pathB enumerations. See the note below about the expected SNMP response.

A value pathA(1) connects the switch output to side A (first input) of the switch. This enumeration is intended for use by an A-B switch.

A value pathB(2) connects the switch output to side B (second input) of the switch. This enumeration is intended for use by an A-B switch.

A value cross(3) connects the switch outputs to the inputs as follows:
Side A (first or primary) output is connected to side B (second or alternate) input.
Side B (second or alternate) output is connected to side A (first or primary) input.
This enumeration is intended for use by a cross-bar switch.

A value bar(4) connects the switch outputs to the inputs as follows:
Side A (first or primary) output is connected to side A (first or primary) input.
Side B (second or alternate) output is connected to side B (second or alternate) input.
This enumeration is intended for use by a cross-bar switch.

A value bothA(5) connects the switch outputs to the inputs as follows:
Side A (first or primary) output is connected to side A (first or primary) input.
Side B (second or alternate) output is connected to side A (first or primary) input.
This enumeration is intended for use by a cross-bar switch.

A value bothB(6) connects the switch outputs to the inputs as follows:
Side A (first or primary) output is connected to side B (second or alternate) input.
Side B (second or alternate) output is connected to side B (second or alternate) input.
This enumeration is intended for use by a cross-bar switch.

*** IMPORTANT ***

It is NOT required that an RF switch support all enumerations. A SET request for an unsupported value shall yield a badValue(3) error by an SNMPv1 agent or an

inconsistentValue(12) by an SNMPv2 agent."
 ::= { heRFSwitchUnitEntry 2 }

heRFSwitchRevertEnable OBJECT-TYPE

SYNTAX HeOnOffControl

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This controls the use of revert switching.

If set to on, the switch will attempt to go back to the preferred settings indicated by heRFSwitchControl if heRFSwitchMode is set to automatic, and the input status of the preferred input is normal. The switch will not attempt to revert to the settings indicated by heRFSwitchControl until heRFSwitchWaitToRestoreTime (if supported) has expired since the preferred input was restored to normal levels.

If set to off, the switch will not attempt to go back to the preferred settings indicated by heRFSwitchControl if heRFSwitchMode is set to automatic, and the input status of the preferred input is normal.

"

::= { heRFSwitchUnitEntry 3 }

heRFSwitchState OBJECT-TYPE

SYNTAX INTEGER {

pathA(1),

pathB(2),

cross(3),

bar(4),

bothA(5),

bothB(6)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Reports the state of the RF Switch. Not all enumerations must be supported. For example, an A-B RF switch may support only the pathA and pathB enumerations while a cross-bar switch may support cross, bar, bothA or bothB or only cross and bar but not pathA and pathB enumerations.

A value pathA(1) indicates that the switch output is being fed by side A (first input) of the switch. This enumeration is intended for use by an A-B switch.

A value pathB(2) indicates that the switch output is being fed by side B (second input) of the switch. This enumeration is intended for use by an A-B switch.

A value cross(3) indicates that the switch outputs are fed as follows:

- Side A (first or primary) output is connected to side B (second or alternate) input.
- Side B (second or alternate) output is connected to side A (first or primary) input.
- This enumeration is intended for use by a cross-bar switch.

A value bar(4) indicates that the switch outputs are fed as follows:

- Side A (first or primary) output is connected to side A (first or primary) input.
- Side B (second or alternate) output is connected to side B (second or alternate) input.
- This enumeration is intended for use by a cross-bar switch.

A value bothA(5) indicates that the switch outputs are fed as follows:

- Side A (first or primary) output is connected to side A (first or primary) input.
- Side B (second or alternate) output is connected to side A (first or primary) input.
- This enumeration is intended for use by a cross-bar switch.

A value bothB(6) indicates that the switch outputs are fed as follows:

- Side A (first or primary) output is connected to side B (second or alternate) input.
- Side B (second or alternate) output is connected to side B (second or alternate) input.
- This enumeration is intended for use by a cross-bar switch."

::= { heRFSwitchUnitEntry 4 }

heRFSwitchFailoverStatus OBJECT-TYPE

SYNTAX HeFaultStatus
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The integral status of both inputs.

A value is fault(2), if current switch state heRFSwitchState is different than the preferred setting heRFSwitchControl, otherwise, it is normal(1).

This object must provide for the alarm management capabilities with a corresponding entry in the discretePropertyTable of SCTE-HMS-PROPERTY-MIB (HMS026).

An alarm shall be recorded as an entry in the currentAlarmTable of SCTE-HMS-PROPERTY-MIB (HMS026).

A log record shall be added as an entry in the heCommonLogTable.

An heCommonAlarmEvent notification shall be sent."

::= { heRFSwitchUnitEntry 5 }

heRFSwitchBothInputStatus OBJECT-TYPE

SYNTAX HeFaultStatus

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The integral status of both inputs.

A value is fault(2), if both input levels are below the nominal value; otherwise, it is normal(1).

This object must provide for the alarm management capabilities with a corresponding entry in the discretePropertyTable of SCTE-HMS-PROPERTY-MIB (HMS026).

An alarm shall be recorded as an entry in the currentAlarmTable of SCTE-HMS-PROPERTY-MIB (HMS026).

A log record shall be added as an entry in the heCommonLogTable.

An heCommonAlarmEvent notification shall be sent."

::= { heRFSwitchUnitEntry 6 }

heRFSwitchHysteresis OBJECT-TYPE

SYNTAX HeTenthdB (-20..20)

UNITS "0.1 dB"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Controls switch input hysteresis amount. The amount of hysteresis used and the ability to change it is to be determined by the vendor."

::= { heRFSwitchUnitEntry 7 }

heRFSwitchWaitToRestoreTime OBJECT-TYPE

SYNTAX Integer32

UNITS "1 sec"

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Controls hysteresis time in sec.

If in automatic switching mode and revert mode is enabled, a switch back to the original side will be delayed for the time specified by this object."

::= { heRFSwitchUnitEntry 8 }

heRFSwitchSensorMode OBJECT-TYPE

SYNTAX INTEGER {

internal (1),

external (2)

}

MAX-ACCESS read-write

```

STATUS    current
DESCRIPTION
    "Controls what source will be used for determining input
        status:
            A value of internal(1) causes the internal RF detection
            circuitry to be used.
            A value of external(2) will use heRFSwitchInputExternalControl
            to determine input status.
        "
::= { heRFSwitchUnitEntry 9 }

```

```

-- the RF Switch Input Table
heRFSwitchInputTable OBJECT-TYPE
    SYNTAX SEQUENCE OF HeRFSwitchInputEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A table containing information about each RF Switch
            input used in an indoor environment."
    ::= { heRFSwitchMIBObjects 2 }

```

```

heRFSwitchInputEntry OBJECT-TYPE
    SYNTAX HeRFSwitchInputEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "List of information about each RF switch input."
    INDEX { entPhysicalIndex, heRFSwitchInputIndex }
    ::= { heRFSwitchInputTable 1 }

```

```

HeRFSwitchInputEntry ::= SEQUENCE
{
    heRFSwitchInputIndex          Unsigned32,
    heRFSwitchInputRFLevel       HeTenthdBmV,
    heRFSwitchSetInputPowerThreshold HeTenthdBmV,
    heRFSwitchInputStatus        HeFaultStatus,
    heRFSwitchInputDescription   DisplayString,
    heRFSwitchInputExternalControl HeFaultStatus
}

```

```

heRFSwitchInputIndex OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Index number corresponding to the RF Input."
    ::= { heRFSwitchInputEntry 1 }

```

```

heRFSwitchInputRFLevel OBJECT-TYPE
    SYNTAX HeTenthdBmV
    UNITS "0.1 dBmV"
    MAX-ACCESS read-only

```

STATUS current
 DESCRIPTION
 "The measured RF input power for the RF switch."
 ::= { heRFSwitchInputEntry 2 }

heRFSwitchSetInputPowerThreshold OBJECT-TYPE
 SYNTAX HeTenthdBmV
 UNITS "0.1 dBmV"
 MAX-ACCESS read-write
 STATUS current
 DESCRIPTION
 "Input power switchover point for this input."
 ::= { heRFSwitchInputEntry 3 }

heRFSwitchInputStatus OBJECT-TYPE
 SYNTAX HeFaultStatus
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The integral status of the input.

A value is fault(2), if the input levels are not in the nominal range; otherwise, it is normal(1).

This object must provide for the alarm management capabilities with a corresponding entry in the discretePropertyTable of SCTE-HMS-PROPERTY-MIB (HMS026).

An alarm shall be recorded as an entry in the currentAlarmTable of SCTE-HMS-PROPERTY-MIB (HMS026).

A log record shall be added as an entry in the heCommonLogTable.

An heCommonAlarmEvent notification shall be sent."

::= { heRFSwitchInputEntry 4 }

heRFSwitchInputDescription OBJECT-TYPE
 SYNTAX DisplayString (SIZE (0..32))
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "A description of the switch input port. The description text is to be determined by the equipment manufacturer. For example, Input A or Side B."
 ::= { heRFSwitchInputEntry 5 }

heRFSwitchInputExternalControl OBJECT-TYPE
 SYNTAX HeFaultStatus
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "This is an external control signal that indicates the status of the associated input.

```

        A value is fault(2), if the external control signal level is not in
        the nominal range; otherwise, it is normal(1)."
 ::= { heRFSwitchInputEntry 6 }

-- the RF Switch Output Table
heRFSwitchOutputTable OBJECT-TYPE
    SYNTAX SEQUENCE OF HeRFSwitchOutputEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "A table containing information about each RF Switch
        output used in an indoor environment."
 ::= { heRFSwitchMIBObjects 3 }

heRFSwitchOutputEntry OBJECT-TYPE
    SYNTAX HeRFSwitchOutputEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "List of information about each RF switch output."
    INDEX { entPhysicalIndex, heRFSwitchOutputIndex }
 ::= { heRFSwitchOutputTable 1 }

HeRFSwitchOutputEntry ::= SEQUENCE
{
    heRFSwitchOutputIndex Unsigned32,
    heRFSwitchOutputDescription DisplayString
}

heRFSwitchOutputIndex OBJECT-TYPE
    SYNTAX Unsigned32
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "Index number corresponding to the RF Output."
 ::= { heRFSwitchOutputEntry 1 }

heRFSwitchOutputDescription OBJECT-TYPE
    SYNTAX DisplayString (SIZE (0..32))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "A description of the switch output port. The description text
        is to be determined by the equipment manufacturer. For example,
        Output A or Secondary Output."
 ::= { heRFSwitchOutputEntry 2 }

-- conformance information
heRFSwitchMIBConformance OBJECT IDENTIFIER ::= { heRFSwitchMIB 2 }

heRFSwitchMIBCompliances OBJECT IDENTIFIER ::= { heRFSwitchMIBConformance 1 }

heRFSwitchMIBGroups OBJECT IDENTIFIER ::= { heRFSwitchMIBConformance 2 }

```

```

heRFSwitchBasicCompliance MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for SNMP HMS Headend RF
      Switch entities which implement the SNMP
      heRFSwitchMIB."
  MODULE -- this module
  MANDATORY-GROUPS { heRFSwitchUnitMandatoryGroup,
                      heRFSwitchInputMandatoryGroup,
                      heRFSwitchOutputMandatoryGroup
                    }
  ::= { heRFSwitchMIBCompliances 1 }

heRFSwitchUnitMandatoryGroup OBJECT-GROUP
  OBJECTS {
    heRFSwitchMode,
    heRFSwitchControl,
    heRFSwitchRevertEnable,
    heRFSwitchState,
    heRFSwitchFailoverStatus
  }
  STATUS current
  DESCRIPTION
    "The main group defines heRFSwitchUnitTable objects which
      are mandatory to all indoor RF switch modules."
  ::= { heRFSwitchMIBGroups 1 }

heRFSwitchInputMandatoryGroup OBJECT-GROUP
  OBJECTS {
    heRFSwitchInputStatus,
    heRFSwitchInputDescription
  }
  STATUS current
  DESCRIPTION
    "The main group defines heRFSwitchInputTable objects which
      are mandatory to all indoor RF switch modules."
  ::= { heRFSwitchMIBGroups 2 }

heRFSwitchOutputMandatoryGroup OBJECT-GROUP
  OBJECTS {
    heRFSwitchOutputDescription
  }
  STATUS current
  DESCRIPTION
    "The main group defines heRFSwitchOutputTable objects which
      are mandatory to all indoor RF switch modules."
  ::= { heRFSwitchMIBGroups 3 }

heRFSwitchUnitGroup OBJECT-GROUP
  OBJECTS {
    heRFSwitchBothInputStatus,
    heRFSwitchHysteresis,

```

```

                                heRFSwitchWaitToRestoreTime,
                                heRFSwitchSensorMode
                                }
STATUS current
DESCRIPTION
    "The collection of heRFSwitchUnitTable objects which are used to
    represent the indoor RF switch module."
 ::= { heRFSwitchMIBGroups 4 }

heRFSwitchInputGroup OBJECT-GROUP
OBJECTS {
                                heRFSwitchInputRFLevel,
                                heRFSwitchSetInputPowerThreshold,
                                heRFSwitchInputExternalControl
                                }
STATUS current
DESCRIPTION
    "The collection of heRFSwitchInputTable objects which are used to
    represent the indoor RF switch module."
 ::= { heRFSwitchMIBGroups 5 }

END
```