Multicon

SNMP Data Model

User manual

Rev. 0

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Revision history

Current revision of this document is the uppermost in the table below.

Rev.	Repl.	Date	Sign	Change description
0	-	20090702	JIH	First official release

Contents

1 Product overview

Multicon is the next-generation element manager for Flashlink system and system controller for VikinX range of routers. The product is based on a new open and distributed architecture and enables customers to deploy one control system for both Flashlink and VikinX.

The new product offers a range of important improvements for router control and also supports control panel access to Flashlink parameters, which is increasingly important for signal processing and distribution applications.

For a more detailed overview of the Multicon product refer to the main manual. This document describes the SNMP interface provided by Multicon for monitoring and configuration of Flashlink systems and VikinX routers.

2 Data model

2.1 High-level overview

The figure below gives an overview of the hierarchy of the MIB model implemented for Flashlink and VikinX.

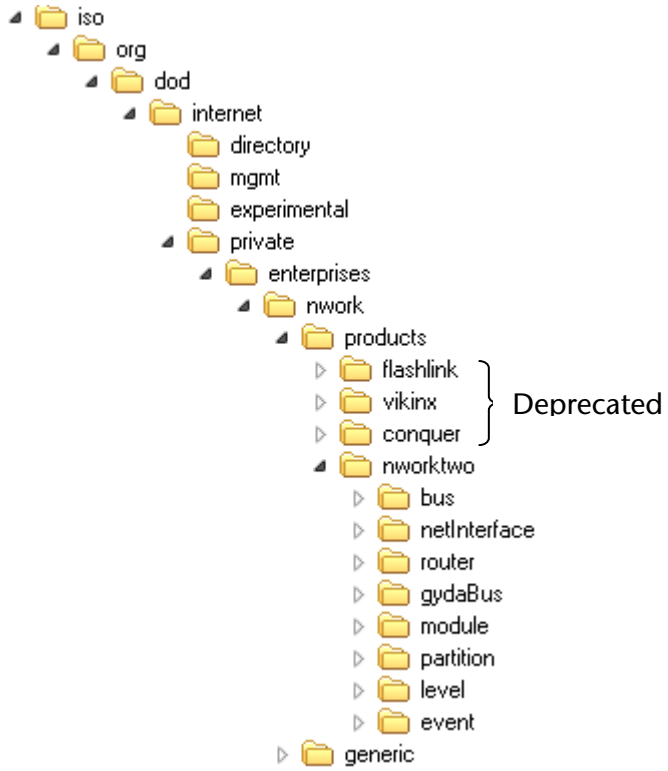


Figure 1: High-level MIB structure

The MIB structure is located under the enterprise OID iso.org.dod.internet.private.enterprises.nwork.products (1.3.6.1.4.1.8768.1). The structure beneath products (1) is described below:

- flashlink (1): deprecated and should not be used, only included for backwards compatibility with older Flashlink cards
- vikinx (2): deprecated and should not be used, only included for backwards compatibility
- conquer (3): deprecated and should not be used, only included for backwards compatibility with older Flashlink SP&D cards
- nworktwo (4): currently supported MIB structure for both Flashlink systems and VikinX routers

Note that it is not necessary to use the flashlink (1), vikinx (2) and conquer (3) MIB structures for new implementations as older Flashlink equipment and VikinX routers is also supported by the currently supported MIB structure under nworktwo (4).

2.2 Current MIB structure – nworktwo

The figure below gives an overview of the nworktwo (4) MIB structure that is currently supported for Flashlink systems and VikinX routers.

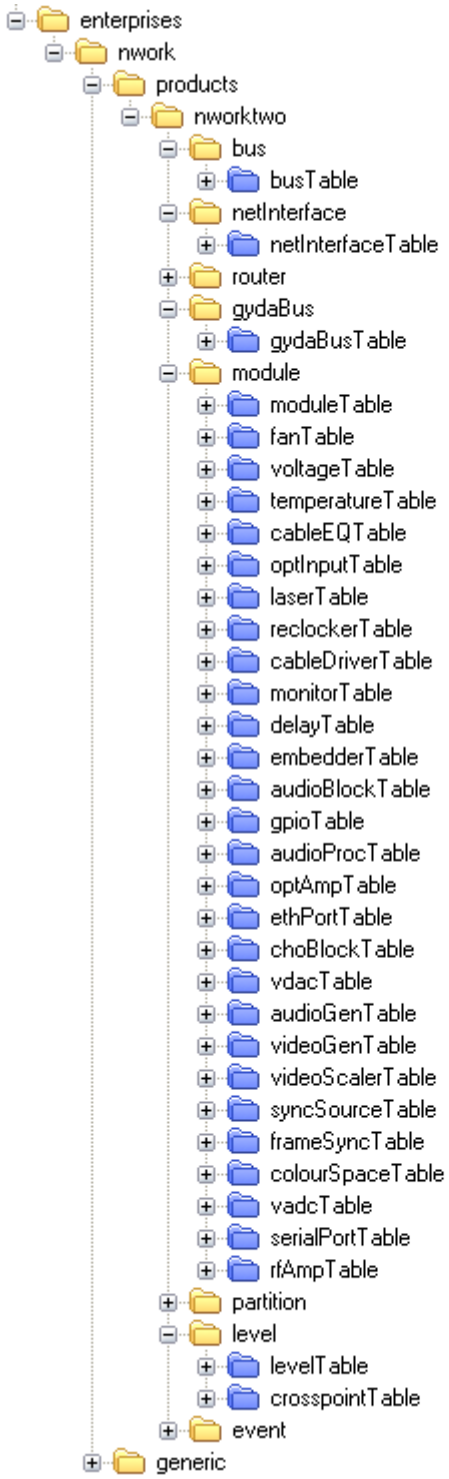


Figure 2: nworktwo (4) MIB structure

The currently supported MIB structure for Flashlink systems and VikinX routers is located under the enterprise OID iso.org.dod.internet.private.enterprises.nwork.products.nworktwo (1.3.6.1.4.1.8768.1.4). The structure beneath nworktwo (4) is described below:

- bus (1): includes busSysType and busNum parameters that is used as index for tables under netInterface (2), router (3), gydaBus (4) and module (5)
- netInterface (2): not in use
- router (3): includes table with general information about managed routers
- gydaBus (4): for internal use only
- module (5): this is the most important part of the MIB structure for Flashlink systems, which includes tables corresponding to logical functions of each module. Note that a module here is either a Flashlink card or a VikinX router.
- partition (6): deprecated and should not be used, includes partition info for VikinX routers.
- level (7): this part of the MIB structure is used for controlling levels and cross-point settings for VikinX routers, but also for controlling matrixes in Flashlink.
- event (8): not in use

2.3 Block functions – module

Each table in the MIB corresponds to a logical function on the card it belongs to. Any card may have any number of each type of block, depending on the type of card.

Each table contains a superset of attributes for each function block, thus there is likely to be unimplemented attributes for most blocks. In a future version of Gyda/Multicon, attributes will be filtered so that only relevant attributes are presented.

For reference to the description for each table within the module tree please refer to the description within the MIB file itself.

Example:

```
cableEQTable OBJECT-TYPE
   SYNTAX  SEQUENCE OF CableEQEntry
   ACCESS  not-accessible
   STATUS  mandatory
   DESCRIPTION
         "The cableEQTable lists all cableEQs for those modules that have them. A module can
have zero or more cableEQs."
   ::= { module 5 }
```

This tells you that this is a table containing all cable equalizers in the system.

2.4 Block addressing – module

Any number of function block of any time may reside on any single card, so the data model is designed for flexibility. Every block is addressed with a 4-dimensional index, although in practice only two of these dimensions are in use for any controller. The *busSysType* parameter is always 2 (*gyda*) for Flashlink cards, and *busNum* is usually 1 for Flashlink cards. This may have been changed in configuration of the Gyda controller.

The last two indices are in active use. *moduleNum* matches the card position, counting index-0, i.e. card position 5 in rack 0 corresponds to *moduleNum = 4*, position 8 in rack 4 corresponds to *moduleNum = 47*. The last index is uniquely named for all blocks, but is simple the address of an instance of that particular table.

Example 1:

NWORK-MIB::moduleAlarmCount.gyda.1.4 = INTEGER: 1
NWORK-MIB::moduleAlarmCount.gyda.1.6 = INTEGER: 5

This shows the module alarm count for Flashlink cards with moduleNum 4 and 6, which translates to cards in frame 0 slots 5 and 7.

Example 2:

NWORK-MIB::cableEQAlarmStatus.gyda.1.6.0 = INTEGER: notacked(3)
NWORK-MIB::cableEQAlarmStatus.gyda.1.6.1 = INTEGER: notacked(3)

This shows the card equalizer alarm status for Flashlink card with moduleNum 6 (frame 0 slot 7). In this case the card has two cable equalizers, which are presented with an additional index to specify the cable equalizers, in this case 0 and 1.

2.5 VikinX router control – level

All globally mapped router levels, i.e. levels that are enabled through the System Configurator for Multicon, are controllable through entries in *crosspointTable*. *levelTable* gives a summary of the router level, and should be used to discover which levels are available in the system.

Example:

NWORK-MIB::crosspointInputNum.3.0 = INTEGER: 0
NWORK-MIB::crosspointInputNum.3.1 = INTEGER: 26
NWORK-MIB::crosspointInputNum.3.2 = INTEGER: 5
...

This shows for level 3 which input in this level the cross-point is switched to, in this case input 0 is switched to output 0, 1 to 26 and 2 to 5.

2.6 Flashlink router matrix control – level

For historical reasons, router control is left outside the module addressed data tree. The card address can still be derived from the level number, as the level numbers for matrices residing in Flashlink cards are calculated from the following formula:

$$\text{Level} = 10000 + \text{position}_{\text{card}} \times 10 + \text{subindex}_{\text{matrix}}$$

These levels are presented *in addition* to the levels mapped using the System Configurator, and are only available on the controller with the physical connection to the cards.

Example:

NWORK-MIB::crosspointInputNum.10080.0 = INTEGER: 0
NWORK-MIB::crosspointInputNum.10080.1 = INTEGER: 0
NWORK-MIB::crosspointInputNum.10080.2 = INTEGER: 4
...

This shows level 10080 which represents the Flashlink card in position 8 with matrix index 0. In this case it is an AV-HD-XMUX de-embedder matrix.

2.7 Generic tree - generic

The MIB also contains a generic tree on the same level as products iso.org.dod.internet.private.enterprises.nwork.generic (1.3.6.1.4.1.8768.4). This part of the MIB may be used for retrieving log information from Multicon.

3 Notifications

Multicon has the capability to send SNMP notifications (traps) when alarms occur in a Flashlink system or VikinX router. The trap types supported are listed in the MIB file.

There are one trap type indicating the raise of an alarm and a corresponding trap type to indicate clear of an alarm. Each trap type contains values from the SNMP data model pertaining to the alarm situation, which enables SNMP managers to poll for more information when a trap is received.

Example:

```
nworkLossOfOptSignal TRAP-TYPE
   ENTERPRISE generic
   VARIABLES { busSysType, busNum, moduleNum, moduleLabel, optInputNum }
   DESCRIPTION "Loss of input signal on optical input."
        ::= 3

nworkCorrectOptSignal TRAP-TYPE
   ENTERPRISE generic
   VARIABLES { busSysType, busNum, moduleNum, moduleLabel, optInputNum }
   DESCRIPTION "Signal on optical input comes back after having been lost."
        ::= 4
```

The example above shows an loss of optical signal alarm and a corresponding clear alarm. In each case the values of busSysType, busNum, moduleNum, moduleLabel and optInputNum is sent with the trap.

4 Data model overview

The figure on the next page gives a total overview of the entire SNMP data model for Multicon.

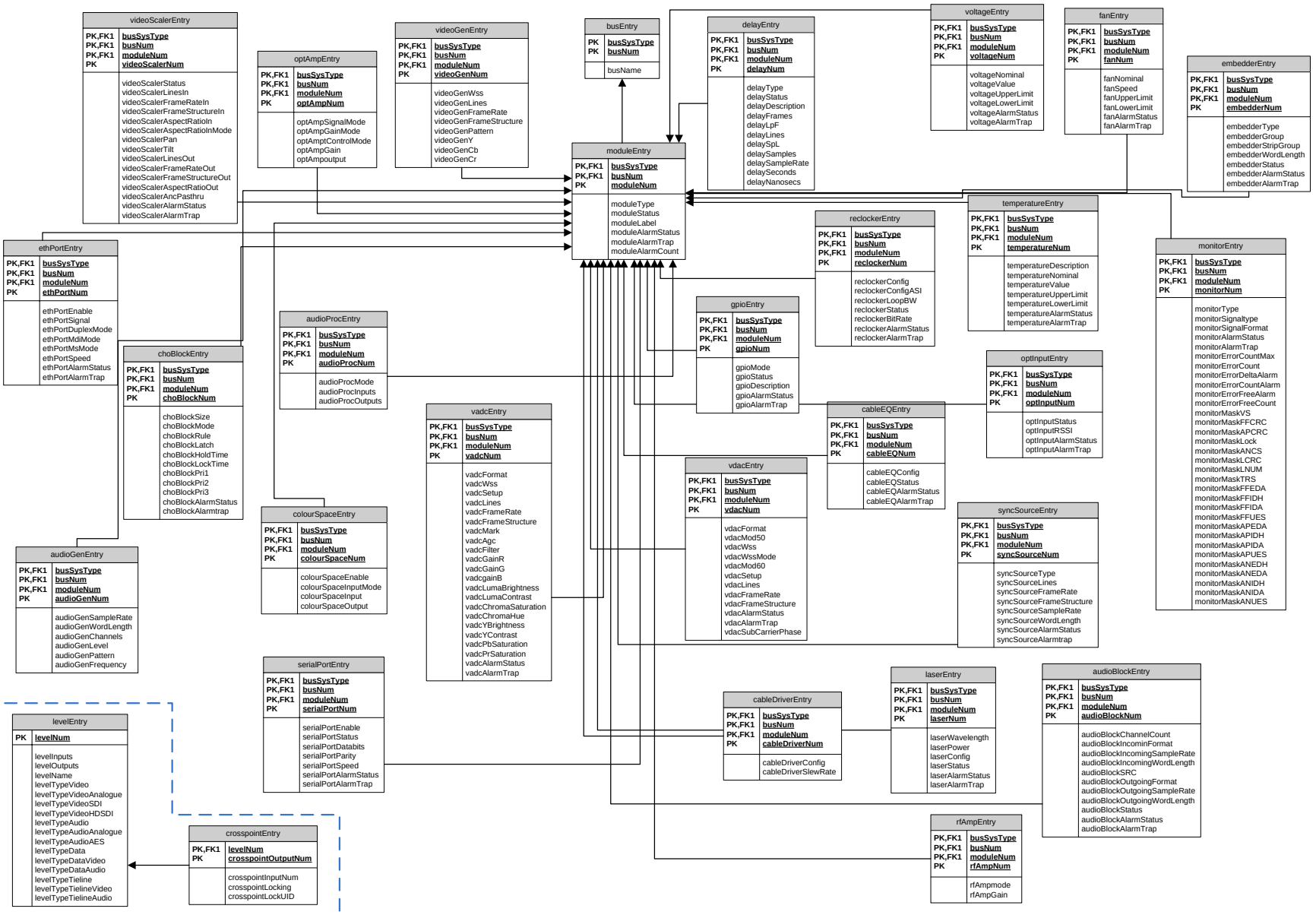
For reference to the description and possible values for each parameter please refer to the description within the MIB file itself.

Example:

```
moduleStatus OBJECT-TYPE
   SYNTAX  INTEGER { ok(1), fail(2), removed(3) }
   ACCESS  read-only
   STATUS  mandatory
   DESCRIPTION
         "Is the module present and operating?"
   ::= { moduleEntry 3 }
```

This shows that it is a read-only parameter with the possible values ok, fail and removed. A relevant description is also shown above.

Note that it is highly recommended to use a MIB browser to read the MIB file as it can be very hard to read the MIB as a text file.


videoScalerEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK videoScalerNum
videoScalerStatus
videoScalerLinesIn
videoScalerFrameRateIn
videoScalerFrameStructureIn
videoScalerAspectRatioIn
videoScalerAspectRatioInMode
videoScalerPan
videoScalerTilt
videoScalerLinesOut
videoScalerFrameRateOut
videoScalerFrameStructureOut
videoScalerAspectRatioOut
videoScalerAncPasthru
videoScalerAlarmStatus
videoScalerAlarmTrap
optAmpEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK optAmpNum
optAmpSignalMode
optAmpGainMode
optAmptControlMode
optAmpGain
optAmpoutput
videoGenEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK videoGenNum
videoGenWss
videoGenLines
videoGenFrameRate
videoGenFrameStructure
videoGenPattern
videoGenY
videoGenCb
videoGenCr
busEntry
PK busSysType
PK busNum
busName
delayEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK delayNum
delayType
delayStatus
delayDescription
delayFrames
delayLpF
delayLines
delaySpL
delaySamples
delaySampleRate
delaySeconds
delayNanosecs
voltageEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK voltageNum
voltageNominal
voltageValue
voltageUpperLimit
voltageLowerLimit
voltageAlarmStatus
voltageAlarmTrap
fanEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK fanNum
fanNominal
fanSpeed
fanUpperLimit
fanLowerLimit
fanAlarmStatus
fanAlarmTrap
embedderEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK embedderNum
embedderType
embedderGroup
embedderStripGroup
embedderWordLength
embedderStatus
embedderAlarmStatus
embedderAlarmTrap
moduleEntry
PK,FK1 busSysType
PK,FK1 busNum
PK moduleNum
moduleType
moduleStatus
moduleLabel
moduleAlarmStatus
moduleAlarmTrap
moduleAlarmCount
ethPortEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK ethPortNum
ethPortEnable
ethPortSignal
ethPortDuplexMode
ethPortMdiMode
ethPortMsMode
ethPortSpeed
ethPortAlarmStatus
ethPortAlarmTrap
choBlockEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK choBlockNum
choBlockSize
choBlockMode
choBlockRule
choBlockLatch
choBlockHoldTime
choBlockLockTime
choBlockPri1
choBlockPri2
choBlockPri3
choBlockAlarmStatus
choBlockAlarmtrap
audioProcEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK audioProcNum
audioProcMode
audioProcInputs
audioProcOutputs
audioGenEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK audioGenNum
audioGenSampleRate
audioGenWordLength
audioGenChannels
audioGenLevel
audioGenPattern
audioGenFrequency
colourSpaceEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK colourSpaceNum
colourSpaceEnable
colourSpaceInputMode
colourSpaceInput
colourSpaceOutput
serialPortEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK serialPortNum
serialPortEnable
serialPortStatus
serialPortDatabits
serialPortParity
serialPortSpeed
serialPortAlarmStatus
serialPortAlarmTrap
levelEntry
PK levelNum
levelInputs
levelOutputs
levelName
levelTypeVideo
levelTypeVideoAnalogue
levelTypeVideoSDI
levelTypeVideoHDSDI
levelTypeAudio
levelTypeAudioAnalogue
levelTypeAudioAES
levelTypeData
levelTypeDataVideo
levelTypeDataAudio
levelTypeTieline
levelTypeTielineVideo
levelTypeTielineAudio
crosspointEntry
PK,FK1 levelNum
PK crosspointOutputNum
crosspointInputNum
crosspointLocking
crosspointLockUID
vadcEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK vadcNum
vadcFormat
vadcWss
vadcSetup
vadcLines
vadcFrameRate
vadcFrameStructure
vadcMark
vadcAgc
vadcFilter
vadcGainR
vadcGainG
vadcgainB
vadcLumaBrightness
vadcLumaContrast
vadcChromaSaturation
vadcChromaHue
vadcYBrightness
vadcYContrast
vadcPbSaturation
vadcPrSaturation
vadcAlarmStatus
vadcAlarmTrap
gpioEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK gpioNum
gpioMode
gpioStatus
gpioDescription
gpioAlarmStatus
gpioAlarmTrap
reclockerEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK reclockerNum
reclockerConfig
reclockerConfigASI
reclockerLoopBW
reclockerStatus
reclockerBitRate
reclockerAlarmStatus
reclockerAlarmTrap
temperatureEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK temperatureNum
temperatureDescription
temperatureNominal
temperatureValue
temperatureUpperLimit
temperatureLowerLimit
temperatureAlarmStatus
temperatureAlarmTrap
monitorEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK monitorNum
monitorType
monitorSignaltype
monitorSignalFormat
monitorAlarmStatus
monitorAlarmTrap
monitorErrorCountMax
monitorErrorCount
monitorErrorDeltaAlarm
monitorErrorCountAlarm
monitorErrorFreeAlarm
monitorErrorFreeCount
monitorMaskVS
monitorMaskFFCRC
monitorMaskAPCRC
monitorMaskLock
monitorMaskANCS
monitorMaskLCRC
monitorMaskLNUM
monitorMaskTRS
monitorMaskFFEDA
monitorMaskFFIDH
monitorMaskFFIDA
monitorMaskFFUES
monitorMaskAPEDA
monitorMaskAPIDH
monitorMaskAPIDA
monitorMaskAPUES
monitorMaskANEDH
monitorMaskANEDA
monitorMaskANIDH
monitorMaskANIDA
monitorMaskANUES
optInputEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK optInputNum
optInputStatus
optInputRSSI
optInputAlarmStatus
optInputAlarmTrap
cableEQEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK cableEQNum
cableEQConfig
cableEQStatus
cableEQAlarmStatus
cableEQAlarmTrap
vdacEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK vdacNum
vdacFormat
vdacMod50
vdacWss
vdacWssMode
vdacMod60
vdacSetup
vdacLines
vdacFrameRate
vdacFrameStructure
vdacAlarmStatus
vdacAlarmTrap
vdacSubCarrierPhase
syncSourceEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK syncSourceNum
syncSourceType
syncSourceLines
syncSourceFrameRate
syncSourceFrameStructure
syncSourceSampleRate
syncSourceWordLength
syncSourceAlarmStatus
syncSourceAlarmtrap
cableDriverEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK cableDriverNum
cableDriverConfig
cableDriverSlewRate
laserEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK laserNum
laserWavelength
laserPower
laserConfig
laserStatus
laserAlarmStatus
laserAlarmTrap
audioBlockEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK audioBlockNum
audioBlockChannelCount
audioBlockIncominFormat
audioBlockIncomingSampleRate
audioBlockIncomingWordLength
audioBlockSRC
audioBlockOutgoingFormat
audioBlockOutgoingSampleRate
audioBlockOutgoingWordLength
audioBlockStatus
audioBlockAlarmStatus
audioBlockAlarmTrap
rfAmpEntry
PK,FK1 busSysType
PK,FK1 busNum
PK,FK1 moduleNum
PK rfAmpNum
rfAmpmode
rfAmpGain

General environmental requirements for Nevion equipment

1. The equipment will meet the guaranteed performance specification under the following environmental conditions:

- Operating room temperature range: 0°C to 45°C
- Operating relative humidity range: <90% (non-condensing)

2. The equipment will operate without damage under the following environmental conditions:

- Temperature range: -10°C to 55°C
- Relative humidity range: <95% (non-condensing)

Product Warranty

The warranty terms and conditions for the product(s) covered by this manual follow the General Sales Conditions by Nevion, which are available on the company web site:

www.nevion.com