

# Versatile diagnostics monitoring for optics


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## Versatile diagnostics monitoring for optics

Versatile diagnostics monitoring (VDM) is an optical-module monitoring capability that . VDM .

- extends traditional Digital Optical Monitoring (DOM)
- provides advanced measurements for supported modules, including signal quality, pre-FEC bit error rates, and laser aging, and
- perform more effective proactive maintenance, troubleshoot complex issues, and assess long-term optical module viability.

Use VDM to gain deeper insight into the health and performance of an optical link. By tracking advanced parameters, you can identify potential issues before they escalate and improve proactive maintenance

## VDM guidelines and support

### Guidelines

VDM feature support is firmware driven and depends on the module's vendor and its specific firmware version. Refer to supported optics table.

***Table 1: VDM platform and release support***

| Platform | Minimum release | Support details |
|---|---|---|
| Cisco Nexus N9364E-SG2-Q switches | Cisco NX-OS Release 10.6(1)F | Supported on VDM-capable optical modules. Available functions depend on the module vendor and firmware version. |

# VDM parameters

The following table lists the VDM observable types, instance types, and units. The displayed parameters and format can vary by module type and system software release.

***Table 2: VDM observable parameters***

| Observable Type | Instance Type | Unit |
|---|---|---|
| **Laser Age (Data Path):** Percentage from Beginning of Life (BOL) to End of Life (EOL). A larger number means it is closer to its EOL. | Basic | % |
| **TEC Current (Module):** The amount of current flowing to the Thermo-Electric Cooler (TEC) of a cooled laser | Basic | % |
| **Laser Frequency Error (Media Lane):** The difference between the target center frequency and the actual current center frequency | Basic | MHz |
| **Laser Temperature (Media Lane):** The temperature difference between the target laser temperature and the actual current temperature for a cooled laser. | Basic | °C |
| **eSNR Media Input (Media Lane):** Electrical Signal-to-Noise Ratio on an ingress optical lane. | Basic | dB |
| **eSNR Host Input (Lane)** | Basic | dB |
| **PAM4 Level Transition Parameter Media Input (Media Lane):** Measures electrical level slicer noise | Basic | dB |
| **PAM4 Level Transition Parameter Host Input (Lane)** | Basic | dB |
| **Pre-FEC BER Minimum Media Input (Data Path):** The minimum Pre-Forward Error Correction Bit Error Ratio observed | Statistic | — |
| **Pre-FEC BER Minimum Host Input (Data Path)** | Statistic | — |
| **Pre-FEC BER Maximum Media Input (Data Path)** | Statistic | — |
| **Pre-FEC BER Maximum Host Input (Data Path)** | Statistic | — |
| **Pre-FEC BER Average Media Input (Data Path)** | Statistic | — |
| **Pre-FEC BER Average Host Input (Data Path)** | Statistic | — |
| **Pre-FEC BER Current Value Media Input (Data Path)** | Basic | — |
| **Pre-FEC BER Current Value Host Input (Data Path)** | Basic | — |
| **FERC Minimum Media Input (Data Path):** Frame Error Count, the number of uncorrectable FEC frames. | Statistic | — |
| **FERC Minimum Host Input (Data Path)** | Statistic | — |

| Observable Type | Instance Type | Unit |
|---|---|---|
| **FERC Maximum Media Input (Data Path)** | Statistic | — |
| **FERC Maximum Host Input (Data Path)** | Statistic | — |
| **FERC Average Media Input (Data Path)** | Statistic | — |
| **FERC Average Host Input (Data Path)** | Statistic | — |
| **FERC Current Value Media Input (Data Path)** | Basic | — |
| **FERC Current Value Host Input (Data Path)** | Basic | — |

# VDM examples

### VDM information for a transceiver

Use the **show interface ethernet** *interface_id* **transceiver vdm** command to display VDM information for a supported transceiver.

```
switch# show interface ethernet 1/4/1 transceiver vdm
Ethernet1/4/1
    transceiver is present
    type is OSFP-8x100G-DR
    name is FINISAR CORP.
    part number is FTCE4517E1PCM
    revision is A0
    serial number is XCNCGZ2
    nominal bitrate is 425000 MBit/sec per channel
    cisco id is 25
    cisco extended id number is 0
    firmware version is 3.5
    Link length SMF is 0.5 km
    Nominal transmitter wavelength is 1311.00 nm
    Wavelength tolerance is 6.500 nm
    host lane count is 4
    media lane count is 4
    max module temperature is 70 deg C
    min module temperature is 0 deg C
    min operational voltage is 3.14 V
    vendor OUI is 0x009065
    date code is 241226
    power class is 8 (>14 W maximum)
    max power is 16.00 W
    near-end lanes used none
    far-end lane code for 8 lanes Undefined
    media interface is 1310 nm EML
    Advertising code is Optical Interfaces: SMF
    media interface advertising code is 400GBASE-DR4 (Cl 124)
Lane Number:1 Network Lane
  Current temperature                   :   28.75 C
  Temperature high alarm                :  Off
  Temperature low alarm                 :  Off
  Temperature high warning              :  Off
  Temperature low warning               :  Off
  Temperature high alarm threshold      :   75.00 C
  Temperature low alarm threshold       :   -5.00 C
```

```
Temperature high warning threshold     :   72.00 C
Temperature low warning threshold      :   -2.00 C
Current voltage                  :    3.34 V
Voltage high alarm               :  Off
Voltage low alarm                :  Off
Voltage high warning             :  Off
Voltage low warning              :  Off
Voltage high alarm threshold         :    3.63 V
Voltage low alarm threshold           :    2.97 V
Voltage high warning threshold       :    3.46 V
Voltage low warning threshold        :    3.13 V
Current current                      :  N/A
Current high alarm                   :  Off
Current low alarm                    :  Off
Current high warning                 :  Off
Current low warning              :  Off
Current high alarm threshold         :  125.00 mA
Current low alarm threshold          :   25.00 mA
Current high warning threshold       :  120.00 mA
Current low warning threshold        :   30.00 mA
Current Tx Power                     :  N/A
Tx power high alarm                  :  Off
Tx power low alarm                   :  Off
Tx power high warning          :  Off
Tx power low warning           :  Off
Tx power high alarm threshold    :    7.39 dBm
Tx power low alarm threshold     :   -3.30 dBm
Tx power high warning threshold  :    5.39 dBm
Tx power low warning threshold   :   -1.30 dBm
Current Rx power                 :    0.66 dBm
Rx power high alarm              :  Off
Rx power low alarm               :  Off
Rx power high warning            :  Off
Rx power low warning             :  Off
Rx power high alarm threshold    :    6.19 dBm
Rx power low alarm threshold      :  -11.24 dBm
Rx power high warnings threshold :    4.19 dBm
Rx power low warnings threshold  :   -9.20 dBm
Transmit Fault Count                    :  0
Laser age                               :    0.00
TEC current                             :  9637.00
Laser frequency error                :  not valid
Laser temperature                       :   10.00
eSNR media input                        :    0.00
eSNR host input                         :  6110.00
PAM4 level transition parameter media input:    0.00
PAM4 level transition parameter host input:  65535.00
Pre-FEC BER minimum media input         :    0.00
Pre-FEC BER minimum host input          :    0.00
Pre-FEC BER maximum media input         :    0.00
Pre-FEC BER maximum host input          :    0.00
Pre-FEC BER average media input         :    0.00
Pre-FEC BER average host input          :    0.00
Pre-FEC BER current media input         :    0.00
Pre-FEC BER current host input          :    0.00
FERC minimum media input                :    0.00
FERC minimum host input                 :    0.00
FERC maximum media input                :    0.00
FERC maximum host input                 :    0.00
FERC average media input                :    0.00
FERC average host input                 :    0.00
FERC current value media input          :    0.00
FERC current value host input           :    0.00
```