



## Monitor Performance

Performance monitoring (PM) parameters are used by service providers to gather, store, set thresholds for, and report performance data for early detection of network issues. You can configure and retrieve PM counters for the various controllers in flex-bin, 30-second, 15-minute, or 24-hour intervals. These parameters simplify troubleshooting operations and enhance data that can be collected directly from the equipment.

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## Monitor Performance

You can set and retrieve PM counters for the OTS, OTS-OCH, OSC, DFB, OCH, and OMS controllers for various intervals.

The OCH and OMS controllers are created when the Mux/Demux panel and breakout panels are powered up using the USB 2.0 connection from the NCS 1010 EITU card. You can only view the current and historical PM parameters for the panels. You cannot configure the PM parameters for these controllers.

This table lists the PM parameters, their descriptions, and precision levels.

**Table 1: PM Parameters for Controllers**

PM Parameter (Unit of Measure)	Description	Resolution
OPT [dBm]	Total Tx(C+OSC) power	1/100
OPR [dBm]	Total Rx(C+OSC) power	1/100
OPT(C+L) [dBm]	Total Tx(C+L+OSC) power	1/100
OPR(C+L) [dBm]	Total Rx(C+L+OSC) power	1/100
OPR(S) [dBm]	C Band Received Signal Power	1/100
OPT(S) [dBm]	C Band Transmitted Signal Power	1/100
OPBR [dBm]	Back Reflection Power	1/100
EAGN [dB]	Egress Amplifier Gain	1/100
EATL [dB]	Egress Amplifier Tilt	1/100

IAGN [dB]	Ingress Amplifier Gain	1/100
IATL [dB]	Ingress Amplifier Tilt	1/100
RAMAN-TOT [mW]	Raman Total Pump power	1/10
RAMAN-1 [mW]	Raman 1 Pump power	1/10
RAMAN-2 [mW]	Raman 2 Pump power	1/10
RAMAN-3 [mW]	Raman 3 Pump power	1/10
RAMAN-4 [mW]	Raman 4 Pump power	1/10
RAMAN-5 [mW]	Raman 5 Pump power	1/10

The following tables list the maximum and minimum thresholds that can be set for the PM parameters for OLT nodes

**Table 2: PM Thresholds for OLT OTS Controller (0/0/0/0)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-2000	4000
OPR	-3000	1800
OPT(C+L)	-2000	6085
OPR(C+L)	-3000	3600
OPR(S)	-3000	1800
OPT(S)	-500	2800
OPBR	-3000	-1400
EAGN	1390	3100
EATL	-500	500
IAGN	1030	3800
IATL	-500	500
RAMAN-TOT	2000	14100
RAMAN-1	450	3900
RAMAN-2	400	3900
RAMAN-3	400	2200
RAMAN-4	400	2200
RAMAN-5	350	1900

**Table 3: PM Thresholds for OLT OTS Controller (0/0/0/2 and 0/0/0/3)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-3000	1500
OPR	-2500	1800
IAGN	1300	1900
IATL	-500	500

**Table 4: PM Thresholds for OLT OTS Controller (0/0/0/4 to 0/0/0/33)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-3000	1500
OPR	-1500	1000

**Table 5: PM Thresholds for OLT OTS-OCH Controller**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-3000	1500
OPR	-3000	1500

**Table 6: PM Thresholds for OLT OSC Controller (0/0/0/0)**

Parameter	Threshold Min	Threshold Max
OPT	-2000	1200
OPR	-3000	0

**Table 7: PM Thresholds for OLT DFB Controller (0/0/0/0)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-2000	1000
OPR	-3000	1500

The following tables list the maximum and minimum thresholds that can be set for the PM parameters for ILA nodes.

**Table 8: PM Thresholds for ILA OTS Controller (0/0/0/0)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-3000	4000

OPR	-3000	2000
OPT(C+L)	-3000	6085
OPR(C+L)	-3000	4000
OPR(S)	-3000	2800
OPT(S)	-3000	2000
OPBR	-3000	-1400
EAGN	590	3600
EATL	-500	500
RAMAN-TOT	2000	14100
RAMAN-1	450	3900
RAMAN-2	400	3900
RAMAN-3	400	2200
RAMAN-4	400	2200
RAMAN-5	350	1900

**Table 9: PM Thresholds for ILA OTS Controller (0/0/0/2)**

<b>PM Parameter</b>	<b>Minimum Threshold</b>	<b>Maximum Threshold</b>
OPT	-3000	4000
OPR	-3000	2000
OPT(C+L)	-3000	6085
OPR(C+L)	-3000	4000
OPR(S)	-3000	2800
OPT(S)	-3000	2000
OPBR	-3000	-1400
EAGN	590	3600
EATL	-500	500
RAMAN-TOT	2000	14100
RAMAN-1	450	3900
RAMAN-2	400	3900

RAMAN-3	400	2200
RAMAN-4	400	2200
RAMAN-5	350	1900

**Table 10: PM Thresholds for ILA OSC Controller (0/0/0/0 and 0/0/0/2)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-2000	1200
OPR	-3000	0

**Table 11: PM Thresholds for ILA OTS-OCH Controllers**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-3000	1500
OPR	-3000	1500

**Table 12: PM Thresholds for ILA DFB Controllers (0/0/0/0 and 0/0/0/2)**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-2000	1000
OPR	-3000	1500

This table lists the maximum and minimum thresholds that are set for the PM parameters for OCH controllers.

**Table 13: PM Thresholds for OCH Controllers**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-30	15
OPR	-30	15

This table lists the maximum and minimum thresholds that are set for the PM parameters for OMS controllers.

**Table 14: PM Thresholds for OMS Controllers**

PM Parameter	Minimum Threshold	Maximum Threshold
OPT	-30	15
OPR	-30	15

# Configure and View PM Parameters

You can configure the performance monitoring parameters for the controllers. To configure PM parameters, use the following commands in the configuration mode:

## Examples

The following example sets the reporting status to maximum TCA for the *eagn* parameter of the OTS controller for a 15-minute interval.

```
RP/0/RP0/CPU0:ios#config
RP/0/RP0/CPU0:ios(config)#controller ots 0/0/0/0 pm 15-min ots report eagn max-tca enable
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#end
```

The following example configures the maximum threshold for the *eagn* parameter of the OTS controller to 20 dB.



**Note** The OTS controller commands accept PM parameter values in two decimal places. In this example, the *eagn* parameter is entered as *2000* to configure the *eagn* parameter to *20 dB*.

```
RP/0/RP0/CPU0:ios#config
RP/0/RP0/CPU0:ios(config)#controller ots 0/0/0/0 pm 15-min ots threshold eagn max 2000
RP/0/RP0/CPU0:ios(config)#commit
RP/0/RP0/CPU0:ios(config)#end
```

To view the current PM parameters on an OTS controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/0 pm current 15-min optics 1
```

The following output shows the current PM parameters on an OTS controller for a 15-minute interval and highlights the *maximum threshold* set for the *eagn* parameter that is configured for *20 dB*.

```
Tue May 17 06:37:00.529 UTC

Optics in the current interval [06:30:00 - 06:37:00 Tue May 17 2022]

Optics current bucket type : Valid

Configured  TCA      MIN      AVG      MAX      Operational  Configured  TCA      Operational
Threshold(max) Threshold(max(max)
OPT[dBm]      : 20.00      20.00      20.00      -20.00      NA          NO      40.00      NA
NO
OPR[dBm]      : 20.00      20.00      20.00      -30.00      NA          NO      18.00      NA
NO
OPT(C+L) [dBm]: 20.00      20.00      20.00      -20.00      NA          NO      60.85      NA
NO
OPR(C+L) [dBm]: -10.00     -10.00     -10.00     -30.00      NA          NO      36.00      NA
NO
OPT(S) [dBm]  : 20.00      20.00      20.00      -5.00       NA          NO      28.00      NA
NO
OPR(S) [dBm]  : 20.00      20.00      20.00      -30.00      NA          NO      18.00      NA
NO
OPBR[dBm]     : -30.00     -30.00     -30.00     -30.00      NA          NO      -14.09     NA
NO
EAGN[dB]     : 30.00     30.00     30.00     16.00     NA         NO     20.00     20.00
```

	YES							
EATL [dB]	: -4.80	-4.80	-4.80	-5.00	NA	NO	5.00	NA
	NO							
IAGN [dB]	: 25.00	25.00	25.00	12.00	NA	NO	25.00	NA
	NO							
IATL [dB]	: -2.40	-2.40	-2.40	-5.00	NA	NO	5.00	NA
	NO							
RAMAN-TOT [mW]	: 300.00	300.00	300.00	200.00	NA	NO	1410.00	NA
	NO							
RAMAN-1 [mW]	: 45.00	45.00	45.00	45.00	NA	NO	390.00	NA
	NO							
RAMAN-2 [mW]	: 40.00	40.00	40.00	40.00	NA	NO	390.00	NA
	NO							
RAMAN-3 [mW]	: 40.00	40.00	40.00	40.00	NA	NO	220.00	NA
	NO							
RAMAN-4 [mW]	: 40.00	40.00	40.00	40.00	NA	NO	220.00	NA
	NO							
RAMAN-5 [mW]	: 35.00	35.00	35.00	35.00	NA	NO	190.00	NA
	NO							

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters on an OTS controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers ots 0/0/0/0 pm history 15-min optics 1 bucket 1
```

The following output shows the historical PM parameters on an OTS controller for a 15-minute interval.

```
Tue May 17 07:02:26.911 UTC

Optics in interval 1 [06:45:00 - 07:00:00 Tue May 17 2022]

Optics history bucket type : Valid
      MIN      AVG      MAX
OPT [dBm]    : 20.00    20.00    20.00
OPR [dBm]    : 20.00    20.00    20.00
OPT (C+L) [dBm]: 20.00    20.00    20.00
OPR (C+L) [dBm]: -10.00   -10.00   -10.00
OPT (S) [dBm] : 20.00    20.00    20.00
OPR (S) [dBm] : 20.00    20.00    20.00
OPBR [dBm]   : -30.00   -30.00   -30.00
EAGN [dB]    : 30.00    30.00    30.00
EATL [dB]    : -4.80    -4.80    -4.80
IAGN [dB]    : 25.00    25.00    25.00
IATL [dB]    : -2.40    -2.40    -2.40
RAMAN-TOT [mW]: 300.00   300.00   300.00
RAMAN-1 [mW] : 45.00    45.00    45.00
RAMAN-2 [mW] : 40.00    40.00    40.00
RAMAN-3 [mW] : 40.00    40.00    40.00
RAMAN-4 [mW] : 40.00    40.00    40.00
RAMAN-1 [mW] : 35.00    35.00    35.00
```

To view the current PM parameters on an OTS-OCH controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers ots-och 0/0/0/0/1 pm current 15-min optics 1
```

The following output shows the current PM parameters on an OTS-OCH controller for a 15-minute interval.

```
Tue May 17 10:27:20.387 UTC

Optics in the current interval [10:15:00 - 10:27:20 Tue May 17 2022]

Optics current bucket type : Valid
      MIN  AVG  MAX Operational  Configured  TCA  Operational  Configured
```

```

TCA
Threshold(max) (max)      Threshold(min)  Threshold(min) (min)  Threshold(max)
OPT[dBm] : 1.20 1.30  1.30  -30.00          NA          NO          15.00
NA      NO
OPR[dBm] :-12.31-12.25-12.20  -30.00          NA          NO          15.00
NA      NO
Last clearing of "show controllers OPTICS" counters never

```

To view the current PM parameters on an OSC controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controller osc 0/0/0/0 pm current 15-min optics 1
```

The following output shows the current PM parameters on an OSC controller for a 15-minute interval.

```

Tue May 17 08:24:32.642 UTC

Optics in the current interval [08:15:00 - 08:24:32 Tue May 17 2022]

Optics current bucket type : Valid
Configured      MIN      AVG      MAX      Operational  Configured      TCA      Operational
Configured      TCA
Threshold(max) Threshold(max) (max)      Threshold(min)  Threshold(min) (min)
OPT[dBm]      : -10.00  -10.00  -10.00  -20.00          NA          NO      12.00
NA            NO
OPR[dBm]      : -30.00  -30.00  -30.00  -30.00          NA          NO      0.00
NA            NO

```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters on a DFB controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controller dfb 0/0/0/0 pm current 15-min optics 1
```

The following output shows the current PM parameters on a DFB controller for a 15-minute interval.

```

Tue May 17 08:28:37.455 UTC

Optics in the current interval [08:15:00 - 08:28:37 Tue May 17 2022]

Optics current bucket type : Valid
MIN  AVG  MAX  Operational  Configured  TCA  Operational  Configured  TCA
Threshold  Threshold  Threshold  Threshold  Threshold
(min)      (min)      (min)      (max)      (max)      (max)
OPT[dBm]: 20.00 20.00 20.00  -25.23  NA  NO  18.00  NA  NO
OPR[dBm]: 10.00 10.00 10.00  -30.00  NA  NO  12.00  NA  NO

```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters for an OCH controller for a 30-second interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm current 30-sec optics 1
```

The following output shows the current PM parameters for an OCH controller for a 30-second interval.

```

Tue May 10 11:28:29.896 UTC

Optics in the current interval [11:28:00 - 11:28:29 Tue May 10 2022]

Optics current bucket type : Valid
MIN  AVG  MAX  Operational  Configured  TCA  Operational
Configured  TCA
Threshold(min)  Threshold(min) (min)  Threshold(max)
OPT[dBm]      : -50.00  -50.00  -50.00  -30.00          NA          NO      15.00
NA            NO

```



```
OPR[dBm]      : -50.00   -50.00   -50.00   -30.00           NA           NO   15.00
                NA           NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters on an OCH controller for a 30-second interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm history 30-sec optics 1 bucket 1
```

The following output shows the historical PM parameters on an OCH controller for a 30-second interval.

Mon Jul 25 05:35:52.176 UTC

Optics in interval 1 [05:35:00 - 05:35:30 Mon Jul 25 2022]

```
Optics history bucket type : Valid
                MIN      AVG      MAX
OPT[dBm]      : -50.00   -50.00   -50.00
OPR[dBm]      : -50.00   -50.00   -50.00
```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters for an OCH controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm current 15-min optics 1
```

The following output shows the current PM parameters for an OCH controller for a 15-minute interval.

Tue May 10 11:28:50.952 UTC

Optics in the current interval [11:15:00 - 11:28:50 Tue May 10 2022]

```
Optics current bucket type : Valid
                MIN      AVG      MAX      Operational      Configured      TCA      Operational
                Configured      TCA
                Threshold(max) (max)      Threshold(min)      Threshold(min) (min)      Threshold(max)
OPT[dBm]      : -50.00   -50.00   -50.00   -30.00           NA           NO   15.00
                NA           NO
OPR[dBm]      : -50.00   -50.00   -50.00   -30.00           NA           NO   15.00
                NA           NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters for an OCH controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm history 15-min optics 1 bucket 1
```

The following output shows the historical PM parameters for an OCH controller for a 15-minute interval.

Mon Jul 25 05:36:12.167 UTC

Optics in interval 1 [05:15:00 - 05:30:00 Mon Jul 25 2022]

```
Optics history bucket type : Valid
                MIN      AVG      MAX
OPT[dBm]      : -50.00   -50.00   -50.00
OPR[dBm]      : -50.00   -50.00   -50.00
```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters on an OCH controller for a 24-hour interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm current 24-hour optics 1
```

The following output shows the current PM parameters on an OCH controller for a 24-hour interval.

```
Tue May 10 11:29:09.270 UTC
Optics in the current interval [00:00:00 - 11:29:09 Tue May 10 2022]

Optics current bucket type : Invalid
      MIN      AVG      MAX      Operational      Configured      TCA      Operational
      Configured      TCA
      Threshold(min)      Threshold(min)      (min)      Threshold(max)
OPT[dBm] : -50.00      -50.00      -50.00      -30.00      NA      NO      15.00
      NA      NO
OPR[dBm] : -50.00      -50.00      -50.00      -30.00      NA      NO      15.00
      NA      NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters on an OCH controller for a 24-hour interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers och 0/1/0/0 pm history 24-hour optics 1
```

The following output shows the historical PM parameters on an OCH controller for a 24-hour interval.

```
Mon Jul 25 05:36:35.165 UTC
Optics in interval 1 [00:00:00 - 24:00:00 Sun Jul 24 2022]

Optics history bucket type : Valid
      MIN      AVG      MAX
OPT[dBm] : -50.00      -50.00      -50.00
OPR[dBm] : -50.00      -50.00      -50.00
```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters for an OMS controller for a 30-second interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm current 30-sec optics 1
```

The following output shows the current PM parameters for an OMS controller for a 30-second interval.

```
Mon Jul 25 07:24:38.319 UTC
Optics in the current interval [07:24:30 - 07:24:38 Mon Jul 25 2022]

Optics current bucket type : Valid
MIN AVG MAX Operational Configured TCA Operational Configured TCA
Threshold(min) Threshold(min) (min) Threshold(max) Threshold(max) (max)
OPT[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
OPR[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters on an OMS controller for a 30-second interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm history 30-sec optics 1 bucket 1
```

The following shows the historical PM parameters on an OMS controller for a 30-second interval.

```
Mon Jul 25 07:13:51.228 UTC
Optics in interval 1 [07:13:00 - 07:13:30 Mon Jul 25 2022]

Optics history bucket type : Valid
      MIN      AVG      MAX
OPT[dBm] : -50.00      -50.00      -50.00
```

```
OPR[dBm] : -50.00 -50.00 -50.00
```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters for an OMS controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm current 15-min optics 1
```

The following output shows the current PM parameters for an OMS controller for a 15-minute interval.

```
Mon Jul 25 07:25:00.183 UTC
```

```
Optics in the current interval [07:15:00 - 07:25:00 Mon Jul 25 2022]
```

```
Optics current bucket type : Valid
MIN AVG MAX Operational Configured TCA Operational Configured TCA
Threshold(min) Threshold(min) (min) Threshold(max) Threshold(max) (max)
OPT[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
OPR[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters for an OMS controller for a 15-minute interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm history 15-min optics 1 bucket 1
```

The following output shows the historical PM parameters for an OMS controller for a 15-minute interval.

```
Mon Jul 25 07:14:03.090 UTC
```

```
Optics in interval 1 [06:45:00 - 07:00:00 Mon Jul 25 2022]
```

```
Optics history bucket type : Valid
          MIN      AVG      MAX
OPT[dBm] : -50.00 -50.00 -50.00
OPR[dBm] : -50.00 -50.00 -50.00
```

Last clearing of "show controllers OPTICS" counters never

To view the current PM parameters on an OMS controller for a 24-hour interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm current 24-hour optics 1
```

The following output shows the historical PM parameters for an OMS controller for a 15-minute interval.

```
Mon Jul 25 07:26:09.817 UTC
```

```
Optics in the current interval [00:00:00 - 07:26:09 Mon Jul 25 2022]
```

```
Optics current bucket type : Valid
MIN AVG MAX Operational Configured TCA Operational Configured TCA
Threshold(min) Threshold(min) (min) Threshold(max) Threshold(max) (max)
OPT[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
OPR[dBm] : -50.00 -50.00 -50.00 -30.00 NA NO 15.00 NA NO
```

Last clearing of "show controllers OPTICS" counters never

To view the historical PM parameters on an OMS controller for a 24-hour interval, use the following command:

```
RP/0/RP0/CPU0:ios#show controllers oms 0/3/0/8 pm history 24-hour optics 1
```

The following output shows the historical PM parameters on an OMS controller for a 24-hour interval.

```
Mon Jul 25 07:18:13.532 UTC
```

```
Optics in interval 1 [00:00:00 - 24:00:00 Sun Jul 24 2022]
```

Optics history bucket type : Valid

	MIN	AVG	MAX
OPT[dBm]	: -50.00	-50.00	-50.00
OPR[dBm]	: -50.00	-50.00	-50.00

Last clearing of "show controllers OPTICS" counters never