DMS-100 Family

XPM DS-1

XPM Operational Measurements Reference Manual (DS-1)

XPM14 and up   Standard   10.01   September 2000

DMS-100 Family

XPM DS-1

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Contents

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About this document

How to check the version and issue of this document

The version and issue of the document are indicated by numbers, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the next software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time the document is revised but rereleased in the same software release cycle. For example, the second release of a document in the same software release cycle is 01.02.

To determine which version of this document applies to the software in your office and how documentation for your product is organized, check the release information in *Product Documentation Directory, 297-8991-001*.

References in this document

The *Operationa Measurements Reference Manual* is referred to in this document.

What precautionary messages mean

The types of precautionary messages used in NT documents include attention boxes and danger, warning, and caution messages.

An attention box identifies information that is necessary for the proper performance of a procedure or task or the correct interpretation of information or data. Danger, warning, and caution messages indicate possible risks.

Examples of the precautionary messages follow.

ATTENTION - Information needed to perform a task

ATTENTION

If the unused DS-3 ports are not deprovisioned before a DS-1/VT
Mapper is installed, the DS-1 traffic will not be carried through the
DS-1/VT Mapper, even though the DS-1/VT Mapper is properly
provisioned.

DANGER - Possibility of personal injury

DANGER
Risk of electrocution
Do not open the front panel of the inverter unless fuses F1,
F2, and F3 have been removed. The inverter contains
high-voltage lines. Until the fuses are removed, the
high-voltage lines are active, and you risk being
electrocuted.

WARNING - Possibility of equipment damage

WARNING
Damage to the backplane connector pins
Align the card before seating it, to avoid bending the
backplane connector pins. Use light thumb pressure to
align the card with the connectors. Next, use the levers on
the card to seat the card into the connectors.

CAUTION - Possibility of service interruption or degradation

CAUTION
Possible loss of service
Before continuing, confirm that you are removing the card
from the inactive unit of the peripheral module.
Subscriber service will be lost if you remove a card from
the active unit.

How commands, parameters, and responses are represented

Commands, parameters, and responses in this document conform to the
following conventions.

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

```
>BSY
```

Commands and fixed parameters

Commands and fixed parameters that are entered at a MAP terminal are shown in uppercase letters:

```
>BSY CTRL
```

Variables

Variables are shown in lowercase letters:

```
>BSY  CTRL  ctrl_no
```

The letters or numbers that the variable represents must be entered. Each variable is explained in a list that follows the command string.

Responses

Responses correspond to the MAP display and are shown in a different type:

```
FP 3 Busy CTRL 0: Command request has been submitted.

FP 3 Busy CTRL 0: Command passed.
```

1 XPM Operational Measurements

XPM product related operational measurements

Operational measurements (OM) monitor and count the occurrences of events in the Digital Multiplex System (DMS) switch. These events include call counts, usage, errors and defects. Print specified OMs at regular intervals as an additional method to detect and identify problems.

The user must schedule and route OMs to output devices. Use the table editor or the command interpreter (CI) commands to modify the contents of specified system data tables.

Refer to *Operational Measurements Reference Manual* for:

• a description of the CI commands

• a description of system data tables

• a description of OM registers

• an explanation how to use the CI commands, system data tables and OM registers in routing and scheduling

• an explanation of OMs and OM registers

Product related OMs

This document provides information on OMs associated with an XPM product or feature. This document includes chapters that describe OMs that relate to a specified XPM product. These chapters provide a description of the OMs and associated OM logs. Refer to the *North American DMS-100 Operational Measurements Reference Manual* for a complete description of all OMs.

2 Outside Plant Module OMs

OPM related operational measurements

Operational measurements (OM) monitor and count the occurrences of events in the Digital Multiplex System (DMS) switch. These events include call counts, use, errors, and faults. Print selected OMs at regular intervals. Use these OMs as an additional method to detect and identify problems.

The OM groups in the following table are associated with the outside plant module (OPM). The following table provides a description of the OM and associated OM logs.

Table 2-1 OPM operational measurements (Sheet 1 of 3)

OM group	Information
CNDXPM	*Description:* This OM group pegs the different conditions in the peripheral in which calling information events occur. The OPM pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to yes, a 5 min OM transfer period occurs. The OM counts are transmitted back to the CC where they are increased and placed in OM group CNDXPM. If office parameter OMHISTORYON is set to no, the transfer period is every 15 min. Special automatic call waiting identification (DSCWID) attempts are also pegged in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OOS) limits for digital trunks and links on digital peripherals.
	Associated logs: PM109, PM110, and PM112
Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

Table 2-1 OPM operational measurements (Sheet 2 of 3)

OM group	Information
ILDBD	*Description:* This group provides information for the ISDN line drawer for remotes (ILDR) Bd-channel. This information allows the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the packet handler. Refer to note.
	Associated logs: There are no associated logs.
ILDBRA	*Description:* This group provides information that relates to ILDR D-channels. This information allows the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the NT1. Refer to note.
	Associated logs: ISDN200 and ISDN201
ILDSTAT	*Description:* This group provides information that relates to the ILDR processor occupancy. This information allows the operating company personnel to measure ILDR processor performance. Refer to note.
	Associated logs: There are no associated logs.
ILDMSGCT	*Description:* This group provides information that relates to ILDR messages to and from the XPM. This information allows the operating company personnel to verify normal transit of messages and DMSX protocol performance. Operating company personnel verifies normal transit messages and DMSX protocols on the DMAX data link between the ILDR and the XPM. Refer to note.
	Associated logs: There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures.
	Associated logs: LINE106, LINE108, LINE138, and NET130
OFZ	*Description:* Provides information for traffic analysis. This OM group summarizes the content of traffic that arrives at an office. This OM group summarizes the first routing, and the routing of outgoing traffic. Registers count calls by the source of the call (trunk or line) and the intended destination. Registers do not count calls by the call destination.
	Associated logs: There are no associated logs.
PM	*Description:* This group counts errors, faults, and maintenance state changes for DMS switch peripheral modules (PM) with node numbers.
	Associated logs: NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM160, PM161, PM162, PM163, PM179, PM180, PM181, PM183, and PM185

Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.

Table 2-1 OPM operational measurements (Sheet 3 of 3)

OM group	Information
PMSTAT	*Description:* This group provides real-time processor occupancy measurements for RLCMs with extended memory line concentrating module (XLCM) equipment and software.
	Associated logs: There are no associated logs.
PMTYP	*Description:* Counts PM errors, faults, and state changes for a group of PMs of the same type.
	Associated logs: There are no associated logs.
RLCDIS	*Description:* Provides information on traffic for intraswitched calls in an RLCM with the intracalling feature package, NTX156AA.
	Associated logs: There are no associated logs.
SITE	*Description:* This group provides information about counts that relate to traffic and dial-tone speed recording (DTSR) for offices with lines that connect to remote sites.
	Associated logs: There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use. These groups count originations and terminations on subscriber lines or groups of lines.
	Associated logs: There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use statistics for the DS-1 links that connect the RLCM to the host XPM. The use of these statistics allows accurate provisioning of the office.
	Associated logs: There are no associated logs.
Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

3 Remote Line Concentrating Module OMs

RLCM related operational measurements

Operational measurements (OM) monitor and count the occurrences of events in the Digital Multiplex System (DMS) switch. These events include call counts, use, errors, and faults. Print selected OMs at regular intervals. Use these prints as an additional method to detect and identify problems.

The following table identifies OM groups that are associated with the remote line concentrating module (RLCM). The table provides a description of the OM and associated OM logs.

Table 3-1 RLCM operational measurements (Sheet 1 of 3)

OM group	Information
CNDXPM	*Description:* This OM group pegs the different conditions in the peripheral where calling information events occur. The remote line concentrating module/outside plant module (RLCM/OPM) pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to yes, a 5 min OM transfer period occurs. The OM counts are transmitted back to the CC where they are increased and placed in OM group CNDXPM. If office parameter OMHISTORYON is set to no, the transfer period is every 15 min. Special automatic call waiting identification (DSCWID) attempts also peg in this OM group. Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals. *Associated logs:* There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OOS) limits for digital trunks and links on digital peripherals. *Associated logs:* PM109, PM110, and PM112
ILDBD	*Description:* This group provides information that relates to the ISDN line drawer for remotes (ILDR) Bd-channel. This information allows the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the packet handler. Refer to note. *Associated logs:* There are no associated logs.
ILDBRA	*Description:* This group provides information that relates to ILDR D-channels. This information allows the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the NT1. Refer to note. *Associated logs:* ISDN200 and ISDN201
ILDSTAT	*Description:* This group provides information that relates to the ILDR processor occupancy. This information allows the operating company personnel to measure ILDR processor performance. Refer to note. *Associated logs:* There are no associated logs.
Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

Table 3-1 RLCM operational measurements (Sheet 2 of 3)

OM group	Information
ILDMSGCT	*Description:* This group provides information that relates to ILDR messages to and from the XPM. This information allows the operating company personnel to verify normal transit of messages and DMSX protocol performance. This action is done on the DMAX data link between the ILDR and the XPM. Refer to note. *Associated logs:* There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures. *Associated logs:* LINE106, LINE108, LINE138, and NET130
OFZ	*Description:* This group provides information for traffic analysis. This OM group summarizes the content of traffic that arrives at an office. This OM group summarizes the first routing, and the routing of outgoing traffic. The calls that registers count depend on the source of the call (trunk or line) and the original destination. *Associated logs:* There are no associated logs.
PM	*Description:* This group counts errors, faults, and maintenance state changes for DMS switch peripheral modules (PM) with node numbers. *Associated logs:* NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM160, PM161, PM162, PM163, PM179, PM180, PM181, PM183, and PM185
PMSTAT	*Description:* This group provides real-time processor occupancy measurements for RLCMs with extended memory line concentrating module (XLCM) equipment and software. *Associated logs:* There are no associated logs.
PMTYP	*Description:* Counts PM errors, faults, and state changes for a group of PMs of the same type. *Associated logs:* There are no associated logs.
RLCDIS	*Description:* This group provides information on traffic for intraswitched calls in an RLCM with the intracalling feature package, NTX156AA. *Associated logs:* There are no associated logs.
SITE	*Description:* This group provides information counts that relate to traffic and dial tone speed recording (DTSR) for offices with lines that connect to remote sites. *Associated logs:* There are no associated logs.
Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

Table 3-1 RLCM operational measurements (Sheet 3 of 3)

OM group	Information
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use. These groups count originations and terminations on subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and statistics on use for the DS-1 links that connect the RLCM to the host XPM. The use of these statistics provide accurate provisioning of the office. *Associated logs:* There are no associated logs.
Note: The ILDR is first available for remote switching center-SONET (RSC-S) and remote switching center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is first available for RLCM, OPM, and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

4 Outside Plant Access Cabinet OMs

OPAC related operational measurements

Operational measurements (OMs) monitor and count events in the DMS-100 switch.

These events can be call counts, usage, errors and faults. The operating company must print specified OMs periodically. Use these OMs as a secondary method to detect and identify problems.

Refer to *Operational Measurements Reference Manual* for detailed information on OMs. Use these OMs to monitor outside plant access cabinet (OPAC) performance.

The following table identifies the OM groups associated with the OPAC. The table provides a description of the OM and associated logs.

Table 4-1 OPAC operational measurements (Sheet 1 of 3)

OM Group	Description and associated logs
CNDXPM	*Description:* This OM group counts the different events in the peripheral when the system does not deliver calling information. The OPAC counts a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to yes, a 5 min OM transfer period occurs. The system transmits OM counts to the central control (CC). In the CC, the system increases the OM counts. The system places the OM counts in OM group CNDXPM. If office parameter OMHISTORYON is set to no, the transfer period is every 15 min. Deluxe spontaneous call waiting identification (DSCWID) attempts also increase in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OOS) limits for digital trunks and links on digital peripherals.
	Associated logs: PM109, PM110 and PM112
ILDBD	*Description:* This group provides information for the Integrated Services Digital Network (ISDN) line drawer for remotes (ILDR) Bd-channel. This information allows operating company personnel to verify normal transit of information (frames) on the links. The information goes between the ILDR and the packet handler. (Note)
	Associated logs: There are no associated logs.
ILDBRA	*Description:* This group provides information for ILDR D-channels. This information allows operating company personnel to verify normal transit of information (frames) on the links. The information goes between the ILD and the NT1. (Note)
	Associated logs: ISDN200 and ISDN201
ILDSTAT	*Description:* This group provides information about the ILDR processor occupancy. This information allows operating company personnel to measure ILDR processor performance. (Note)
	Associated logs: There are no associated logs.

Note: The ILDR is available for Remote Switching Center-SONET (RSC-S) and Remote Switching Center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and OPAC configurations in the NA008/XPM81 timeframe.

Table 4-1 OPAC operational measurements (Sheet 2 of 3)

OM Group	Description and associated logs
ILDMSGCT	*Description:* This group provides information about ILDR messages to and from the XPM. This information allows operating company personnel to verify normal transit of messages and DMS-X protocol performance on the DMAX data link. Operating company personnel verify this activity between the ILDR and the XPM. (Note)
	Associated logs: There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures.
	Associated logs: LINE106, LINE108, LINE138 and NET130
OFZ	*Description:* Provides information for traffic analysis. This OM group summarizes traffic that arrives at an office, the first routing and the routing of outgoing traffic.
	The source of the call (trunk or line) and the intended destination (not the actual destination) determine how the registers count calls.
	Associated logs: There are no associated logs.
PM	*Description:* This group counts errors, faults and maintenance state transitions for DMS peripheral modules (PM) with node numbers.
	Associated logs: NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM160, PM161, PM162, PM163, PM179, PM180, PM181, PM183 and PM185
PMSTAT	*Description:* This group provides real-time processor occupancy measurements for OPACs with extended memory line concentrating module (XLCM) equipment and software.
	Associated logs: There are no associated logs.
PMTYP	*Description:* Counts PM errors, faults and state transitions for a group of PMs of the same type.
	Associated logs: There are no associated logs.
RLCDIS	*Description:* Provides information on traffic for intraswitched calls in an OPAC with the intracalling feature package (NTX156AA).
	Associated logs: There are no associated logs.
SITE	*Description:* This group provides information about traffic-related counts and dial tone speed recording (DTSR) for offices with lines connected to remote sites.
	Associated logs: There are no associated logs.

Note: The ILDR is available for Remote Switching Center-SONET (RSC-S) and Remote Switching Center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and OPAC configurations in the NA008/XPM81 timeframe.

Table 4-1 OPAC operational measurements (Sheet 3 of 3)

OM Group	Description and associated logs
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use and count originations and terminations on selected subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use statistics for the DS-1 links. These DS-1 links connect the OPAC to the host XMS-based peripheral module (XPM). Use these statistics to provide more accurate provisioning of the office. *Associated logs:* There are no associated logs.
Note: The ILDR is available for Remote Switching Center-SONET (RSC-S) and Remote Switching Center (RSC) configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and OPAC configurations in the NA008/XPM81 timeframe.	

5 Remote Switching Center OMs

RSC related operational measurements

Operational measurements (OM) monitor and count the occurrences of events in the Digital Multiplex System (DMS) switch. These events can be call counts, use, errors and faults. Operating company personnel must print specified OMs at normal intervals. Use these OMs as an additional method to detect and identify problems.

The following table identifies the OM groups associated with the remote switching center (RSC). The table describes the OM and associated logs.

Table 5-1 RSC operational measurements (Sheet 1 of 3)

Group	Information
CNDXPM	*Description:* This OM group pegs the occurrences of calling information events in the peripheral. The RSC pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to yes, the OM transfer period is 5 min. The system transmits OM counts to the CC. At the CC, the system increases the OM counts and places the OM counts in OM group CNDXPM. If office parameter OMHISTORYON is set to no, the transfer period is every 15 minutes. Deluxe spontaneous call waiting identification (DSCWID) attempts also peg in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* Monitors the DS-1 for performance degradation.
	Associated logs: PM109 and PM110

Note: The ILDR is available for SONET remote switching center (RSC-S) and RSC configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.

Table 5-1 RSC operational measurements (Sheet 2 of 3)

Group	Information
ILDBD	*Description:* This group provides information that concerns the ISDN line drawer for remotes (ILDR) Bd-channel. This information enables the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the packet handler. (Note) *Associated logs:* There are no associated logs.
ILDBRA	*Description:* This group provides information for ILDR D-channels. This information allows the operating company personnel to verify normal transit of information (frames) on the links. Information travels between the ILDR and the NT1. (Note) *Associated logs:* ISDN200 and ISDN201
ILDSTAT	*Description:* This group provides information that concerns the ILDR processor occupancy. This information enables the operating company personnel to measure ILDR processor performance. (Note) *Associated logs:* There are no associated logs.
ILDMSGCT	*Description:* This group provides information that concerns ILDR messages to and from the XPM. This information enables the operating company personnel to verify normal transit of messages and DMSX protocol performance on the DMAX data link. This data link is between the ILDR and the XPM. (Note) *Associated logs:* There are no associated logs.
PM	*Description:* This group tracks the components of the RSC. This group contains the peg and use counts. The operating company can track the state of the peripheral module (PM) and the length of time the PM is in that state. *Associated logs:* NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183 and PM185 *Note:* The OM group PM2 counts errors, faults and maintenance-state changes for the SMS-R.
PMTYP	*Description:* This group tracks the same information as PM, but on a PM-type condition. *Associated logs:* PM100, PM102, PM108, PM109, PM110, PM111, PM125, PM128, PM151, PM179, PM180, PM181, PM182, PM183, PM185, 221, PM222, PM223, PM600 and UTR100

Note: The ILDR is available for SONET remote switching center (RSC-S) and RSC configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.

Table 5-1 RSC operational measurements (Sheet 3 of 3)

Group	Information
PMSTAT	*Description:* This group records statistics on microprocessor occupancy for each extended line concentrating module (XLCM) unit.
	Associated logs: There are no associated logs.
UTR	*Description:* The universal tone receiver (UTR) registers count and record call processing requests from lines and trunks for UTRs. The UTR registers also count the activities in request wait queues. The UTR has 32 channels and is in an XMS-based peripheral module (XPM).
	Associated logs: UTR100
XPMLNK	*Description:* This group measures link blockage and use for all XPMs with switched lines (not nailed-up). This group enables a more accurate provisioning of the office.
	Associated logs: There are no associated logs.
XPMOCC	*Description:* This group reports processor occupancy, and origination and termination counts for the Universal Processor (UP).
	Associated logs: There are no associated logs.
XPMOVLD	*Description:* This group counts the number of call attempts the XPM flow control system impacts, discards or delays. This group only counts delays that are important. The number of calls the XPM impacts determines when the XPM enters the overload state. The number of calls the XPM impacts provides information that regards the seriousness of XPM overload events.
	Associated logs: PM106 and 128
Note: The ILDR is available for SONET remote switching center (RSC-S) and RSC configurations in the NA007/XPM08 timeframe. The ILDR is available for remote line concentrating module (RLCM), outside plant module (OPM) and outside plant access cabinet (OPAC) configurations in the NA008/XPM81 timeframe.	

6 Subscriber Carrier Module SLC-96 OMs

SMS related operational measurements

Operational measurements (OM) contain records of events that occur during a given time period. There are three basic types of measurements: increase counts, use, and overflow. Use OMs as service level indicators, as input for maintenance, and to assign hardware and software. Use OMs for accounting, and provisioning decisions. The *Operational Measurements Reference Manual* describes all OMs.

The following table identifies OM groups that are associated with the Subscriber Carrier Module for SLC-96 (SMS)-RCS subsystem. The table also provides a description of the OM and associated OM logs.

Table 6-1 SMS operational measurements (Sheet 1 of 3)

Group	Information
CND	*Description:* This group indicates the office-wide use of call number delivery (CND), dialable directory number (DDN), calling name delivery (CNAMD), and long distance indicator (LDI). This office-wide use includes resource shortages or denials that result from the use of these features. Central control (CC) increases these OMs. Each time calling information is delivered, the OM group CND increases. Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate the total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals. *Associated logs:* There are no associated logs.
CNDXPM	*Description:* This group pegs the different conditions in the peripheral where calling information is not delivered. If office parameter OMHISTORYON in table OFCOPT is set to yes, a 5 min OM transfer period occurs. The OM counts are transmitted back to the CC, where they are increased and placed in OM group CNDXPM. If the office parameter OMHISTORYON is set to no, the transfer period is every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts are also pegged in this OM group. *Associated logs:* There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OOS) limits for digital trunks on digital peripherals. *Associated logs:* PM109 and PM110
ESP	*Description:* This group counts calls on necessary service lines. This group counts failures to process essential line calls because there are not enough resources available. *Associated logs:* There are no associated logs.
LMD	*Description:* Counts call attempts and call attempt failures. *Associated logs:* LINE106, LINE108, LINE138, and NET130
MWTCAR	*Description:* Provides information on feature use, traffic measurements, and failures. These failures occur because there are not enough hardware and software resources supplied for the message waiting (MWT) feature. *Associated logs:* There are no associated logs.

Table 6-1 SMS operational measurements (Sheet 2 of 3)

Group	Information
PM	*Description:* This group counts errors, faults, and maintenance-state transitions for DMS peripheral modules (PM) with node numbers. ***Note:*** Use OM group PM2 to count errors, faults, and maintenance-state changes for the SMS. *Associated logs:* NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185
PMOVLD	*Description:* This group tracks call traffic when the SMS enters overload. *Associated logs:* PM106 and PM128
RADR	*Description:* This register generates test call originations. This test determines the interval between a request for attachment to a receiver and the time of connection to a receiver. *Associated logs:* There are no associated logs.
SITE2	*Description:* This group provides information about counts that relate to traffic and dial-tone speed recording (DTSR). This group generates this information for offices with lines that connect to remote concentrator SLC-96 (RCS) sites and remote carrier urban (RCU) sites. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, TRA250M2	*Description:* These groups provide information about line use and count originations and terminations on subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
UTR	*Description:* The universal tone receiver (UTR) registers count and record call processing requests from lines and trunks for UTRs. The UTR registers record and count the activities in request wait queues. The UTR has 32 channels and resides in an XMS-based peripheral module (XPM). *Associated logs:* UTR100
XPMLNK	*Description:* Measures link blockage and use for all XPMs with switched lines that are not nailed-up. This measurement helps to provide accurate provisioning of the office. *Associated logs:* There are no associated logs.

Table 6-1 SMS operational measurements (Sheet 3 of 3)

Group	Information
XPMOCC	*Description:* Reports processor occupancy, and origination and termination counts for the Universal Processor (UP). *Associated logs:* There are no associated logs.
XPMOVLD	*Description:* Counts the number of call attempts the XPM flow control system impacts, discards or delays. The number of calls the XPM flow control system affects determines when the XPM enters the overload state. The number of calls the XPM flow control system affects provides information about the level of the XPM overload events. *Associated logs:* PM106 and 128

7 Subscriber Carrier Module Urban OMs

SMU related operational measurements

Operational measurements (OMs) monitor and count the occurrences of events within the DMS-100 switch. These events include call counts, use, errors, and faults. Print selected OMs at regular intervals. Use these OMs as an additional method to detect and identify problems.

Refer to the *Operational Measurements Reference Manual* for additional information about operational measurements used to monitor SMU performance.

The following table identifies OM groups associated with the Subscriber Carrier Module-100 Urban (SMU)-RCU subsystem. The table describes the OM and associated OM logs.

Table 7-1 SMU operational measurements (Sheet 1 of 4)

Group	Information
BCAPCG	*Description:* This OM group measures bearer capability for each customer group.
	Associated logs: There are no associated logs.
BCAPOF	*Description:* This OM group measures bearer capability for each office.
	Associated logs: There are no associated logs.
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. This information includes resource shortages or denials that result from the use of these features. Central control (CC) increases these OMs. Each time the system delivers calling information, a peg in the OM group CND increases. The CND registers count attempts, completions, and failures to access a feature.
	Associated logs: There are no associated logs.

Table 7-1 SMU operational measurements (Sheet 2 of 4)

Group	Information
CNDXPM	*Description:* The CND XMS-based peripheral module (XPM) group pegs the different conditions in the peripheral where calling information events occur. The SMU pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, an OM that the user defines the transfer period activates. The transfer period is normally 5 min. The OM counts are transmitted back to CC where they are increased and placed in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period that the user defines is normally every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts are also pegged in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate the total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
CPICG	*Description:* This group pegs the different conditions in the peripheral where calling information is not delivered. The SMU pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, a 5 min OM transfer period occurs. The OM counts are transmitted back to the CC where they are increased and placed in OM group CNDXPM. If the office parameter is set to NO, the transfer period is every 15 min.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: PM109 and PM110
DTSRPM	*Description:* Dial-tone speed recording provides information on dial-tone speed recording for each PM for all line concentrating devices.
	Associated logs: There are no associated logs.
ESP	*Description:* This group counts calls on necessary service lines and failures to process essential line calls. This call occurs because there are not enough resources available.
	Associated logs: There are no associated logs.
ISGBD	*Description:* The ISDN service group Bd channel performance summary OM group monitors traffic handling. This action occurs on Bd-type D-channels in ISDN offices equipped with ISDN peripherals. A Bd channel is a D-channel that carries data to a packet handler.
	Associated logs: There are no associated logs.

Table 7-1 SMU operational measurements (Sheet 3 of 4)

Group	Information
ISGBRA	*Description:* This group monitors traffic on basic rate (BRA) D-channels in ISDN offices that have peripherals equipped with ISDN. *Associated logs:* There are no associated logs.
ISGCPU	*Description:* This group measures the processor occupancy of an ISG. The first ten registers form a histogram of the average processor occupancy of an ISG. *Associated logs:* There are no associated logs.
ISGOVLD	*Description:* This group measures the overload of an ISG. *Associated logs:* There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures. *Associated logs:* LINE106, LINE108, LINE138, and NET130
MWTCAR	*Description:* This OM group provides information about feature use and traffic measurements. This OM group provides information about failures that occur because not enough hardware and software resources are supplied for the MWT feature. *Associated logs:* There are no associated logs.
PM	*Description:* This group counts errors, faults, and maintenance state transitions for DMS switch peripheral modules with node numbers. *Associated logs:* NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185
PMOVLD	*Description:* This group tracks call traffic when the SMA enters overload. *Associated logs:* PM106 and PM128
RADR	*Description:* This group generates test call originations. Test call originations determines the interval between a request for attachment to a receiver and the connection to a receiver. *Associated logs:* There are no associated logs.
SITE2	*Description:* This group provides information about counts that relate to traffic and DTSR for offices with lines that connect to remote digital terminals. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use and count originations and terminations on subscriber lines or groups of lines. *Associated logs:* There are no associated logs.

Table 7-1 SMU operational measurements (Sheet 4 of 4)

Group	Information
UTR	*Description:* This group of registers counts and records call processing requests from lines for universal tone receivers.
	Associated logs: There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use for all XPMs with switched lines that are not nailed-up. This group allows accurate provisioning of the office.
	Associated logs: There are no associated logs.

8 Subscriber Carrier Module-100 Access OMs

SMA related operational measurements

Operational measurements (OM) monitor and count the occurrences of traffic and maintenance events within the DMS switch. These events include call counts, use, errors, and faults. Print selected OMs at regular intervals. Use these OMs as an additional method to detect and identify problems.

Refer to *Operational Measurements Reference Manual* for additional information on operational measurements used to monitor Subscriber Carrier Module-100 Access (SMA) performance.

The following table identifies OM groups associated with the SMA system. The table describes the OM and associated OM logs.

Table 8-1 SMA operational measurements (Sheet 1 of 3)

Group	Information
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. This information includes any resource shortages or denials that result from the use of these features. Central control (CC) increases these OMs. Each time the system receives the calling information, a peg in the OM group CND increases. The CND registers count attempts, completions, and failures to access a feature.
	Associated logs: There are no associated logs.
CNDXPM	*Description:* The CND XMS-based peripheral module (XPM) group pegs the different conditions in the peripheral where calling information events occur. The SMA pegs a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, an OM transfer period that the user defines activates. The transfer period is normally 5 min. The OM counts are transmitted back to the CC where they are increased and are placed in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period that the user defines is normally every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts also peg in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate the total events that occur in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
CPICG	*Description:* This group pegs the different conditions in the peripheral where calling information does not deliver. The SMA pegs an internal OM. If office parameter OMHISTORYON in table OFCOPT is set YES a 5 min OM transfer period occurs. The OM counts are transmitted back to the CC where they are increased and placed in OM group CNDXPM. If the office parameter is set to NO, the transfer period is every 15 min.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: PM109 and PM110
DTSRPM	*Description:* Dial tone speed recording provides information on dial tone speed recording for each PM for all line concentrating devices.
	Associated logs: There are no associated logs.

Table 8-1 SMA operational measurements (Sheet 2 of 3)

Group	Information
ESP	*Description:* This group counts calls on necessary service lines and failures to process essential line calls because of a resource shortage.
	Associated logs: There are no associated logs.
ISGBD	*Description:* The ISDN service group Bd channel performance summary OM group monitors traffic handling on Bd-type D-channels. The ISDN service group Bd channel performance summary OM group monitors traffic in ISDN offices that have peripherals equipped with ISDN. A Bd channel is a D-channel that carries data to a packet handler.
	Associated logs: There are no associated logs.
ISGBRA	*Description:* This group monitors traffic on basic rate (BRA) D-channels in ISDN offices that have peripherals equipped with ISDN.
	Associated logs: There are no associated logs.
ISGCPU	*Description:* This group measures the processor occupancy of an ISG. The first ten registers form a histogram of the average processor occupancy of an ISG.
	Associated logs: There are no associated logs.
ISGOVLD	*Description:* This group measures the degree an ISG overloads.
	Associated logs: There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures.
	Associated logs: LINE106, LINE108, LINE138, and NET130
PM	*Description:* This group counts errors, faults, and maintenance state transitions for DMS switch PMs with node numbers.
	Associated logs: NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185
PM2	*Description:* This OM group captures maintenance information on dual unit PMs. The registers in this group count error conditions. Error conditions include: exception reports, diagnostic faults, and the use of system busy and manual busy.
	Associated logs: There are no associated logs.
PMOVLD	*Description:* This group tracks call traffic when the SMA enters overload.
	Associated logs: PM106 and PM128

Table 8-1 SMA operational measurements (Sheet 3 of 3)

Group	Information
PMTYP	*Description:* This group counts PM errors, faults, and state transitions for a group of PMs of the same type. *Associated logs:* PM100, PM102, PM108, PM109, PM110, PM111, PM125, PM128, PM151, PM179, PM180, PM181, PM182, PM183, PM185, 221, PM222, PM223, PM600 and UTR100
OFZ	*Description:* This group provides information for traffic analysis. This OM group summarizes the structure of traffic that arrives at an office. This OM group summarizes the first routing, and the routing of outgoing traffic. The calls that registers count depend on the source of the call (trunk or line) and the original destination. The calls that registers count do not depend on the destination that the call reaches. *Associated logs:* There are no associated logs.
SITE2	*Description:* This group provides information about counts that relate to traffic and DTSR for offices with lines that connect to remote digital terminals. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use and count originations and terminations on subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
UTR	*Description:* This group of registers counts and records call processing requests from lines for universal tone receivers. *Associated logs:* There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use for all XPMs with switch lines that are not nailed-up. This group allows accurate provisioning of the office. *Associated logs:* There are no associated logs.
XPMOCC	*Description:* Reports processor occupancy, and origination and termination counts for the universal processor (UP) and enhanced ISDN signaling pre-processor (EISP). *Associated logs:* There are no associated logs.
XPMOVLD	*Description:* Counts the number of call attempts that the XPM flow control system impacts, discards or delays. The number of calls that the XPM flow control system impacts determines when the XPM enters the overload state. The number of calls that the XPM flow control system impacts provides information about the level of XPM overload events. *Associated logs:* PM106 and 128

9 Subscriber Carrier Module-100 Access MVI-20 OMs

SMA MVI-20 related operational measurements

Operational measurements (OM) monitor and count the occurrences of traffic and maintenance events in the DMS switch. These events include items like call counts, use, errors, and defects. Print selected OMs on a periodic base. Use the OMs to detect and identify problems.

Refer to the *Operational Measurements Reference Manual* for detailed information on operational measurements. These measurements monitor Subscriber Carrier Module-100 Access (SMA) performance.

The OM groups that appear in the following table associate with the multi-vendor interface (MVI) 20 variant of the SMA system. The SMA

MVI-20 supports a maximum of 20 DS-1 links on the peripheral side (P-side). The table provides a description of the OM and associated logs.

Table 9-1 SMA MVI-20 operational measurements (Sheet 1 of 3)

Group	Information
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. The CND group indicates any resource shortages or denials. Central control (CC) increases these OMs. The value of OM group CND increases when the CND delivers calling information. The CND registers count attempts, completions, and failures to access a feature.
	Associated logs: There are no associated logs.
CNDXPM	*Description:* The CND XMS peripheral module (XPM) group increases when a calling information event occurs in the peripheral. The SMA increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, the system activates an OM transfer period. The normal duration of this period is 5 min. The system transmits the OM counts back to central control (CC). The CC increases the count and places the count in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period normally occurs every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts increase in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. CNDXPM registers accumulate all the events that occurred in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
CPICG	*Description:* This group increases each occurrence in the peripheral where the CND does not deliver calling information. The SMA increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, a 5 min OM transfer period occurs. The system transmits the OM counts back to the CC. The CC increases the OM counts and places the counts in OM group CNDXPM. If the office parameter is set to NO, the transfer period occurs in 15 min intervals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: Logs PM109 and PM110 are associated logs.
DTSRPM	*Description:* Dial tone speed recording on a peripheral module (PM) base provides information for each PM for all line concentrating devices.
	Associated logs: There are no associated logs.

Table 9-1 SMA MVI-20 operational measurements (Sheet 2 of 3)

Group	Information
ESP	*Description:* This group counts calls on essential service lines and failures to process essential line calls because of resource shortages.
	Associated logs: There are no associated logs.
ISGBD	*Description:* The ISDN service group Bd channel performance summary OM group monitors traffic handling on Bd-type D-channels in ISDN offices that have ISDN-equipped peripherals. A Bd channel is a D-channel used to carry data to a packet handler.
	Associated logs: There are no associated logs.
ISGBRA	*Description:* This group monitors traffic on basic rate (BRA) D-channels in ISDN offices that have ISDN-equipped peripherals.
	Associated logs: There are no associated logs.
ISGCPU	*Description:* This group measures the processor occupancy of an ISG. The first ten registers form a histogram of the average processor occupancy of an ISG.
	Associated logs: There are no associated logs.
ISGOVLD	*Description:* This group measures the degree an ISG is overloaded.
	Associated logs: There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures.
	Associated logs: Logs LINE106, LINE108, LINE138, and NET130 are associated logs.
PM	*Description:* This group counts errors, defects, and maintenance state changes for DMS switch peripheral modules that contain node numbers.
	Associated logs: Logs NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185 are associated logs.
PM2	*Description:* This OM group captures maintenance information on dual unit PMs. The registers in this group count error conditions like exception reports, diagnostic defects, and system busy and manual busy use.
	Associated logs: There are no associated logs.
PMOVLD	*Description:* This group tracks the call traffic when the SMA enters overload.
	Associated logs: Logs PM106 and PM128 are associated logs.

Table 9-1 SMA MVI-20 operational measurements (Sheet 3 of 3)

Group	Information
PMTYP	*Description:* This group counts PM errors, defects, and state changes for a group of PMs, of the same type. *Associated logs:* Logs PM100, PM102, PM108, PM109, PM110, PM111, PM125, PM128, PM151, PM179, PM180, PM181, PM182, PM183, PM185, 221, PM222, PM223, PM600 and UTR100 are associated logs.
OFZ	*Description:* This group provides information for traffic analysis. This OM group summarizes the structure of traffic that arrives at an office. This OM group summarizes the routing, and the routing of outgoing traffic. The source of the call and the intended destination determines how registers count the calls. The source of the call can be a trunk or line. The destination does not determine how the registers count calls. *Associated logs:* There are no associated logs.
SITE2	*Description:* This group provides information about traffic-related counts and DTSR for offices with lines connected to remote digital terminals. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about the use of lines, count originations, and terminations on selected subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
UTR	*Description:* This group of registers counts and records call processing requests from lines for universal tone receivers. *Associated logs:* There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use for all XPMs with switched lines. Switched lines are lines that are not nailed-up. This measurement provides for more accurate provisioning of the office. *Associated logs:* There are no associated logs.
XPMOCC	*Description:* Reports processor occupancy, and origination and termination counts for the universal processor (UP) and enhanced ISDN signaling pre-processor (EISP). *Associated logs:* There are no associated logs.
XPMOVLD	*Description:* Counts the number of call attempts that the XPM flow control system impacted, discarded or delayed. The number of calls impacted determines when the XPM enters the overload state. The number of calls impacted provides information about the severity of XPM overload events. *Associated logs:* Logs PM106 and 128 are associated logs.

10 Expanded Subscriber Carrier Module-100 Access OMs

SMA2 related operational measurements

Operational measurements (OM) monitor and count the occurrences of traffic and maintenance events in the DMS switch. These events include items like call counts, use, errors, and defects. Print selected OMs on a periodic base. Use the OMs to detect and identify problems.

Refer to the *Operational Measurements Reference Manual* for information on operational measurements. Operational measurements monitor Expanded Subscriber Carrier-100 Access (ESMA). Another name for ESMA is the Subscriber Carrier Module-100 Access, second version (SMA2) performance.

The OM groups that appear in the following table are associated with the SMA2 system. The table provides a description of the OM and associated logs.

Table 10-1 SMA2 operational measurements (Sheet 1 of 3)

Group	Information
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. The CND group indicates any resource shortages or denials that occur. The central control (CC) increases these OMs. When the CND delivers calling information, the value of the OM group CND increases.
	Associated logs: There are no associated logs.
CNDXPM	*Description:* The CND XMS-based peripheral module (XPM) group increases when calling information events occur in the peripheral. The SMA2 increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, the system activates a user-defined OM transfer period. The normal duration of this period is 5 min.. The system transmits the OM counts back to the CC. The CC increases the OM counts and places the OM counts in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period occurs every 15 min.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers all events that occurred in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
CPICG	*Description:* This group increases the occurrences in the peripheral where the CND does not deliver calling information. The SMA2 increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, a 5 min OM transfer period occurs. The system transmits the OM counts back to the CC. The CC increases the OM counts and places the OM counts in OM group CNDXPM. If the office parameter is set to NO the transfer period occurs at 15 min intervals.
	Associated Logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: Logs PM109 and PM110 are associated logs.
DTSRPM	*Description:* Dial tone speed recording on a peripheral module (PM) base provides information on dial tone speed recording for each PM for all line concentrating devices.
	Associated logs: There are no associated logs

Table 10-1 SMA2 operational measurements (Sheet 2 of 3)

Group	Information
ESP	*Description:* This group counts calls on an essential service line. This group counts failures to process essential line calls that occur because there are not enough resources. *Associated logs:* There are no associated logs.
ISGBD	*Description:* The ISDN service group Bd channel performance summary OM group monitors traffic handling on Bd-type D-channels. This event occurs in ISDN offices that have ISDN-equipped peripherals. A Bd channel is a D-channel that carries data to a packet handler. *Associated logs:* There are no associated logs.
ISGBRA	*Description:* This group monitors traffic on basic rate access (BRA) D-channels in ISDN offices that have ISDN-equipped peripherals. *Associated logs:* There are no associated logs.
ISGCPU	*Description:* This group measures the processor occupancy of an ISG. The first ten registers form a histogram of the average processor occupancy of an ISG. *Associated logs:* There are no associated logs.
ISGOVLD	*Description:* This group measures the degree of an overloaded ISG. *Associated logs:* There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures. *Associated logs:* Logs LINE106, LINE108, LINE138, and NET130 are associated logs.
PM	*Description:* This group counts errors, defects, and maintenance state changes for DMS peripheral modules with node numbers. *Associated logs:* Logs NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185 are associated logs.
PM2	*Description:* This OM group captures maintenance information on dual unit PMs. The registers in this group count error conditions like exception reports, diagnostic defects, and system busy or manually-busy use. *Associated logs:* There are no associated logs.
PMOVLD	*Description:* This group tracks the call traffic when the SMA2 enters overload. *Associated logs:* Logs PM106 and PM128 are associated logs.
PMTYP	*Description:* This group counts PM errors, defects, and state changes for a group of PMs, that are the same type.

Table 10-1 SMA2 operational measurements (Sheet 3 of 3)

Group	Information
OFZ	*Description:* This group provides information for traffic analysis. This OM group indicates the type of traffic at an office, the initial routing, and the routing of outgoing traffic. The source of the call and the destination determines how a register counts the call. The source of the call can be a trunk or line. The destination does not determine how the register counts the call. *Associated logs:* There are no associated logs.
SITE2	*Description:* This group provides information about traffic-related counts and DTSR for offices with lines that connect to remote digital terminals. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line use, count originations and terminations on selected subscriber lines or groups of lines. *Associated logs:* There are no associated logs.
UTR	*Description:* This group of registers counts and records call processing requests from lines for universal tone receivers. *Associated logs:* There are no associated logs.
XPMLNK	*Description:* This group measures link blockage and use for all XMS-based peripheral modules (XPM) with switched lines. This measurement provides for more accurate provisions for the office. A switched line is a line that is not nailed-up. *Associated logs:* There are no associated logs.

11 Remote Switching Center-SONET OMs

RSC-S related operational measurements

Operational measurements (OM) records event occurrences or resource use.

Operational measurements are used to:

*   provision for traffic

*   monitor service

*   account for allocations

*   evaluate markets

*   identify problems

*   locate problems

To schedule and route OMs to output devices, change the contents of the specified system data tables. Use table editor (TE) or command interpreter (CI) commands to change these contents. The OMs associated with the Remote Switching Center-SONET (RSC-S) are in the following table. For an

explanation of all the OMs and the OM registers, refer to *Operational Measurements Reference Manual*.

Table 11-1 RSC-S operational measurements (Sheet 1 of 3)

Group	Information
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. The CND includes resource shortages or denials that occur. Central control (CC) increases these OMs. When CND delivers calling information, the value of the OM group CND increases. The CND registers count attempts, completions, and failures to access a feature.
	Associated logs: There are no associated logs.
CNDXPM	*Description:* The CND XMS-based peripheral module (XPM) group increases the occurrence of calling information attempts in the peripheral. The RSC-S increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, the system activates a user-defined OM transfer period. The normal duration of this period is 5 min. The system transmits the OM counts back to CC. The CC increases the OM counts and places the OM counts in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period occurs every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts increase in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events that occurred in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: Logs PM109 and PM110 are associated logs.
DTSRPM	*Description:* Dial tone speed recording, on a peripheral module (PM) base, provides information for each PM on all line concentrating devices.
	Associated logs: There are no associated logs.
ESP	*Description:* This group counts calls on essential service lines and failures to process essential line calls that occur because of resource shortages.
	Associated logs: There are no associated logs.

Table 11-1 RSC-S operational measurements (Sheet 2 of 3)

Group	Information
ISGBD	*Description:* The ISDN service group Bd channel performance summary OM group monitors traffic handling on Bd-type D-channels. This event occurs in ISDN offices that have ISDN-equipped peripherals. A Bd channel is a D-channel that carries data to a packet handler. *Associated logs:* There are no associated logs.
ISGBRA	*Description:* This group monitors traffic on basic rate (BRA) D-channels in ISDN offices that have ISDN-equipped peripherals. *Associated logs:* There are no associated logs.
ISGCPU	*Description:* This group measures the processor occupancy of an ISG. The first ten registers form a histogram of the average processor occupancy of an ISG. *Associated logs:* There are no associated logs.
ISGOVLD	*Description:* This group measures the overloaded ISG. *Associated logs:* There are no associated logs.
LMD	*Description:* This group counts call attempts and call attempt failures. *Associated logs:* Logs LINE106, LINE108, LINE138, and NET130 are associated logs.
PM	*Description:* This group counts errors, defects, and maintenance state changes for DMS switch peripheral modules that contain node numbers. *Associated logs:* Logs NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185 are associated logs.
PM2	*Description:* This OM group captures maintenance information on dual unit PMs. The registers in this group count error conditions like exception reports, diagnostic errors, and use that is system busy or manually-busy. *Associated logs:* There are no associated logs.
RSCIR	*Description:* Group RSCIR evaluates traffic loads on interswitching channels. *Associated logs:* There are no associated logs.
RSCIS	*Description:* Group RSCIS evaluates traffic loads on intraswitching channels in a Remote Switching Center-SONET(RSC-S). *Associated logs:* There are no associated logs.

Table 11-1 RSC-S operational measurements (Sheet 3 of 3)

Group	Information
SITE	*Description:* Group SITE provides information about traffic-related counts and dial tone speed recording information for remote sites. *Associated logs:* There are no associated logs.
XPMOCC	*Description:* Reports processor occupancy, and origination and termination counts. Group XPMOCC reports these counts for the universal processor (UP) and enhanced ISDN signaling pre-processor (EISP). *Associated logs:* There are no associated logs.
XPMOVLD	*Description:* Counts the number of call attempts the XPM flow control system impacted, discarded or delayed. The number of calls impacted determines when the XPM enters the overload state. This number provides information about the severity of XPM overload events. *Associated logs:* Logs PM106 and 128 are associated logs.

12 Subscriber Carrier Module-100S Remote OMs

SMS-R related operational measurements

Operational measurements (OM) contain records of events that occur during a specified time period.

Three types of OM measurements occur:

- peg counts
- use
- overflow

Operational measurements are used for:

- service-level indicators
- input for maintenance
- hardware and software assignment
- account and provision decisions

A description of all operational measurements appears in *Operational Measurements Reference Manual*.

The following table specifies OM groups associated with the Subscriber Carrier Module-100S Remote (SMS-R)/Remote Concentrator SLC-96 (RCS) subsystem. The table provides a description of the OM and associated logs.

Table 12-1 SMS-R operational measurements (Sheet 1 of 2)

Group	Information
CND	*Description:* The calling number delivery (CND) group indicates the office-wide use of CND, DDN, CNAMD and LDI. The CND group includes resource shortages or denials. Central control (CC) increases these OMs. When the CND delivers call information, a value in the OM group increases. The CND registers count attempts, completions, and failures to access a feature.
	Associated logs: There are no associated logs.
CNDXPM	*Description:* The CND XMS-based peripheral module (XPM) group increases the occurrence of calling information events in the peripheral. The SMSR increases a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to YES, the system activates a user-defined OM transfer period. The normal duration of this period is 5 min. The system transmits the OM counts back to CC. The CC increases the OM counts and places the OM counts in OM group CNDXPM. If office parameter OMHISTORYON is set to NO, the transfer period occurs every 15 min. The CNDXPM counts spontaneous call waiting identification (SCWID) attempts, completions, failures, and SCWID overlap. Deluxe spontaneous call waiting identification (DSCWID) attempts increase in this OM group.
	Use the OMSHOW CNDXPM HOLDING command to view the CLASS Modem Resource (CMR) card events at the end of a monitoring period. The CNDXPM registers accumulate total events occurred in the current monitoring period. The OMSHOW CNDXPM ACTIVE command does not display the current OM period count totals.
	Associated logs: There are no associated logs.
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OS) limits for digital trunks.
	Associated logs: Logs PM109 and PM110 are associated logs.
ESP	*Description:* This group counts calls on essential service lines and failures to process essential line calls that occur because of resources shortages.
	Associated logs: There are no associated logs.
LMD	*Description:* This group counts call attempts and failures.
	Associated logs: Logs LINE106, LINE108, LINE138, and NET130 are associated logs.

Table 12-1 SMS-R operational measurements (Sheet 2 of 2)

Group	Information
PM	*Description:* This group counts errors, defects, and maintenance state changes for DMS switch peripheral modules that contain node numbers. *Associated logs:* Logs NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM180, PM181, PM183, and PM185 are associated logs.
PMOVLD	*Description:* This group tracks the call traffic when the SMA enters the overload state. *Associated logs:* Logs PM106 and PM128 are associated logs.
SITE2	*Description:* This group provides information about traffic-related counts and DTSR for offices with lines that connect to remote digital terminals. *Associated logs:* There are no associated logs.
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about use of lines and count originations. These groups provide information about terminations on selected subscriber lines or groups of lines. *Associated logs:* There are no associated logs.

13 Star Remote System OMs

Star Remote Hub-related operational measurements

Operational measurements (OM) monitor and count the occurrences of traffic and maintenance events in the Digital Multiplex System (DMS) switch. These events include items like call counts, use, errors, and faults. Print selected OMs periodically. Use the OMs as a additional method of trouble detection and identification.

The OM groups identified in the following table are associated with the Star Hub and Star Module. The term remote line drawer (RLD) in this chapter refers to the Star Module. The table provides a description of the OM and associated logs.

Table 13-1 Star Remote System operational measurements (Sheet 1 of 5)

OM group	Information
CNDXPM	*Description:* This OM group counts the different occurrences in the peripheral where calling information events occur. The Star Hub counts a set of internal OMs. If office parameter OMHISTORYON in table OFCOPT is set to yes, there is a 5-minute OM transfer period. The OM counts are transmitted back to the central control (CC) where they increment and place in OM group CNDXPM. If office parameter OMHISTORYON is set to no, the transfer period is every 15 minutes. Deluxe spontaneous call waiting identification (DSCWID) attempts are also counted within this OM group. View the CLASS Modem Resource (CMR) card events at the end of a monitoring period with the OMSHOW CNDXPM HOLDING command. CNDXPM registers accumulate total events which have occurred in the current monitoring period. The OMSHOW CNDXPM ACTIVE command will not display the current OM period count totals. *Associated logs:* None
DS1CARR	*Description:* This group provides information about maintenance limits and out-of-service (OOS) limits for digital trunks and links on digital peripherals. *Associated logs:* PM109, PM110, and PM112
ILDBD	*Description:* This group provides information pertaining to the ISDN line drawer for remotes (ILD-R) Bd-channel. This information enables the operating company personnel to verify normal transit of information (frames) on the links between the ILD-R and the packet handler. *Associated logs:* None
ILDBRA	*Description:* This group provides information pertaining to ILD-R D-channels. This information enables the operating company personnel to verify normal transit of information (frames) on the links between the ILDR and the NT1. *Associated logs:* ISDN200 and ISDN201

Table 13-1 Star Remote System operational measurements (Sheet 2 of 5)

OM group	Information
ILDSTAT	*Description:* This group provides information pertaining to the ILD-R processor occupancy. This information enables the operating company personnel to measure ILD-R processor performance. *Associated logs:* None
ILDMSGCT	*Description:* This group provides information pertaining to ILD-R messages to and from the XPM. This information enables the operating company personnel to verify normal transit of messages and DMSX protocol performance on the DMSX data link between the ILD-R and the XPM. *Associated logs:* None
LMD	*Description:* This group counts call attempts and call attempt failures. *Associated logs:* LINE106, LINE108, LINE138, and NET130
OFZ	*Description:* Provides information for traffic analysis. This OM group summarizes the composition of traffic that arrives at an office, the initial routing, and the routing of outgoing traffic. Registers count calls depending on the source of the call (trunk or line) and the intended destination, rather than the actual destination. *Associated logs:* None.
PM	*Description:* This group counts errors, faults, and maintenance state transitions for DMS switch peripheral modules (PM) with node numbers. *Associated logs:* NET101, NET102, PM100, PM101, PM102, PM107, PM108, PM109, PM110, PM113, PM114, PM115, PM116, PM117, PM118, PM119, PM122, PM124, PM125, PM126, PM128, PM152, PM160, PM161, PM162, PM163, PM179, PM180, PM181, PM183, and PM185
PM2	*Description:* This group captures maintenance information on dual unit PMs. The registers in this group count error conditions such as exception reports, diagnostic faults, and system busy and manual busy usage. *Associated logs:* None

Table 13-1 Star Remote System operational measurements (Sheet 3 of 5)

OM group	Information
PMDRFLT	*Description:*
	This group counts the number of critical error messages received from the Star Module.
	Associated logs: None
PMDRERR	*Description:*
	This group counts the number of major and minor software errors received from the Star Module.
	Associated logs: None
PMDRMBU	*Description:*
	This group counts the number of drawer manual busy actions operating company personnel perform.
	Associated logs: None
PMDRSBU	*Description:*
	This group counts the number of drawer system busy actions the DMS-100 maintenance system performs.
	Associated logs: None
PMOVLD	*Description:*
	Tracks call traffic when the Star Hub has entered overload.
	Associated logs: PM106 and PM128
PMMSGCNT	*Description:*
	This group provides information from the Star Hub maintenance counters. These counters count messages from the Star Hub to the host line trunk controller (LTC), line group controller (LGC), and remote cluster controller 2 (RCC2) and from the host LTC, LGC, or RCC2 to the Star Hub. The contents of the counters can be displayed at the STAR level of the MAP display by entering the QUERYPM command.
	Associated logs: None
PMSTAT	*Description:*
	This group provides real-time processor occupancy measurements.
	Associated logs: None

Table 13-1 Star Remote System operational measurements (Sheet 4 of 5)

OM group	Information
PMTYP	*Description:* Counts PM errors, faults, and state transitions for a group of PMs of the same type. *Associated logs:* None
RLCDIS	*Description:* Provides information on traffic, call attempts, and blocked calls for intraswitched calls in Star Hub. *Associated logs:* None
RLDBRA	*Description:* Provides information on RLD D-channels, so operating company personnel can verify the normal transit of information (frames) on the links between the RLD and the NT1. *Associated logs:* ISDN200 and ISDN201
RLDBD	*Description:* Provides information on RLD Bd-channels so operating company personnel can verify normal transit of information (frames) on the links between the RLD and the packet handler. *Associated logs:* None
RLDSTAT	*Description:* Provides information on RLD processor occupancy so operating company personnel can measure RLD processor performance. *Associated logs:* None
RLDMSGCT	*Description:* Provides information on RLD messages to/from the XPM so operating company personnel can verify normal transit of messages and LAPD protocol performance on the LAPD data link between the RLD and the XPM. *Associated logs:* None
SITE	*Description:* This group provides information about traffic-related counts and dial tone speed recording (DTSR) for offices with lines connected to remote sites. *Associated logs:* None

Table 13-1 Star Remote System operational measurements (Sheet 5 of 5)

OM group	Information
TRA125M1, TRA125M2, TRA250M1, ENG640M1	*Description:* These groups provide information about line usage and count originations and terminations on selected subscriber lines or groups of lines. *Associated logs:* None
XPMLNK	*Description:* This group measures link blockage and usage statistics for the DS-1 links that connect the Star Hub to the host PM. These statistics are used to provide more accurate provisioning of the office. *Associated logs:* None

DMS-100 Family
XPM DS-1
XPM Operational Measurements Reference Manual (DS-1)