BARCO Simple Network Management Protocol for Barco DP projectors

White Paper

BARCO

Visibly yours

TABLE OF CONTENTS

1. SNMP

Overview

The DP projectors support remote monitoring through Simple Network Management Protocol (SNMP). SNMP is a generic protocol that used to monitor networked devices. It allows central management systems to get information from these devices, or to alarms from the devices.

The Simple Network Management Protocol (SNMP) is by far, the dominant protocol in network management. A key reason for its widespread acceptance, besides being the chief Internet standard for network management is its relative simplicity. Implementing SNMP management in a networked device is far more straightforward than most other standard or non-standard approaches to network management.

The internal SNMP Server in the projector supports SNMP messages in V.1/V.2/v.2c. The v.2C public context (community name) allows access to the supported MIBs.

1.1   What is a SNMP Agent

Definitions

A SNMP Agent is a process that runs in the networked device, in our case the projector.

The Agent will perform two tasks:
*   It will handle the SNMP requests from the management system, and respond with the requested data. E.g. the network man-agement system requests the temperature of the Red DMD, the Agent will answer the temperature
*   It will send SNMP traps on its initiative to the management system. A trap is an alarm message. E.g. a certain fan is broken, and its speed goes under a certain limit. The SNMP Agent will send an alarm/trap to the network management system

1.2   What is a MIB

Definitions

SNMP defines a client/server relationship. The network management system makes virtual connections to the SNMP agent, on the projector, which responds with information to the network management system regarding the projector's status.

A database describing the application parameters is created in the agent. The network management system uses this database to request the agent and interpret the traps received. This database is referred to as the SNMP Management Information Base (MIB). There is a standard set parameters that can be managed and monitored in a projector. These are described in a MIB which is a part of the SNMP.

Basically a MIB defines which information the SNMP Agent of the projector (or networked device) provides, and how it will be pro-vided.

Every projector type/family will have a different MIB, as different data has to be managed by the projector.

There are currently 2 sets of MIBs available:
*   1 set for DP100/DP3000
*   1 set for DP2000/DP1500DP1200

1.3   Installation of a SNMP Agent on a projector

Overview

The SNMP Agent is by default present on the projector. It can be enabled by inserting the SNMP Key, using *Communicator* software. Go to *Installation/Advanced/Functionality keys*.

The SNMP Agent will be started once a correct key is inserted in the projector.

The only thing you need to configure is the IP address of the management system that needs to receive the traps/alarms. This can be done also with the *Communicator* software. Go to *Installation/Advanced/SNMP Configuration*.

1.4   Where and how do I need the MIB

Overview

The MIB is used by the network management system, The MIB tells the management system, which information and how it can be managed. Basically you need to insert/compile the MIB in the network management system. How to do this highly depends on the network management system that is used.

Below some instructions for some management systems. This information might not be up to date as management systems tend to evolve also.

A MIB for DP projectors is composed of 5 MIB files. All 5 MIB files need to inserted/compiled into the network management system.

e.g. for DP100/DP3000 these files are:
•   BARCO-ME-DC-REG.mib
•   BARCO-ME-DC-COM.mib
•   BARCO-ME-DC-TI-MON-MIB.mib
•   BARCO-ME-DC-PROJ-MON-MIB.mib
•   BARCO-ME-DC-DP100-MON-MIB.mib

When compiling the MIB it is preferred that this is done in the following order:
1.   BARCO-ME-DC-REG.mib
2.   BARCO-ME-DC-COM.mib
3.   then all the others

1. What up Gold or Whats up Professional from Ipswitch
actions before starting the application:
1.   check if IpSwitch WhatsUp Engine service is started
2.   check if most recent mib files are present under $install_dir\Data\Mibs

start WUP : All Programs/ IpSwitch WhatsUp Professional 2005 / IpSwitch WhatsUp Professionel 2005
mib compiling:
1. $install_dir\mibextra.exe $install_dir\Data*mib

=> mib.txt and defs.txt are created or modified
trap importing:
1. $install_dir\trapimport.exe

=> traps.txt is created are modified and traps are known in database
Enable trap receiving:
1.   Device Properties/Program Options/Passive Monitor Listeners/SNMP Trap/Configure…
2.   SNMP Listener Configuration: Listen for messages on port 162
       Accept unsolicited SNMP traps

2. SNMPc from Castle Rock
actions before starting the application:
1.   1. check if SNMP Trap Service and SNMP Service are started
2.   copy mib files to $install_dir\mibfiles\

start SNMPc : All Programs/SNMPc Network Manage/Startup System
mib compiling:
1.   Go to the menu Config/Mib Datatbase…
2.   "Compile" button will compile all listed files

3. HP Open View NNM
actions before starting the application:
1.   check if SNMP Trap Service and SNMP Service are started
2.   start all OpenView services All Programs/HP OpenView/Network Node Manager Admin/NNM Services-Start
3.   copy mib files to a "BARCO" subdir under $install_dir\snmp_mibs\Vendor

start NNM: All Programs/HP OpenView/Network Node Manager Admin/ Network Node Manager
mib compiling:
1.   Options/Load-Unload MIBs SNMP/xxxxx.mib
2.   A dialog box will ask if the traps should be made accessible in the Event Configuration or not.
       -    Choose Cancel for a quick trap test and be satisfied with the default format in the alarm browser.
       -    Choose OK and do the customization via the Event Configuration afterwards.

1.5   What information on DP projectors can be managed through SNMP

Overview

Per projector Family BARCO provides 5 MIB files.

e.g for DP100/ DP3000 you have
*   BARCO-ME-DC-REG.mib
*   BARCO-ME-DC-COM.mib
*   BARCO-ME-DC-TI-MON-MIB.mib
*   BARCO-ME-DC-PROJ-MON-MIB.mib
*   BARCO-ME-DC-DP100-MON-MIB.mib

Description the MIB files:

MIB	Description
BARCO-ME-DC-REG	The top level registration module for Barco Digital Cinema. This file is part of the sub-tree areas under the BARCO enterprise number. It contains the administrative identifiers for the top-level product divisions and product families. Does not contain projector specific data.
BARCO-ME-DC-COM	Common module for all the ME-DC modules. Bundles all ME-DC modules. Does not contain projector specific data.
BARCO-ME-DC-TI-MON	Module for all DLP Cinema® Texas Instruments properties. Contains all the parameters of the DLP Cinema® front end.
BARCO-ME-DC-PROJ	Module for the general projector properties.
BARCO-ME-DC-DP100	Module for DP100 and DP3000 specific properties. This modules will be different per DP product family.

The next topics give a description per MIB of what information can be retrieved and managed. Always check the MIB files, which hold the most recent variable indications and also hold the details what the possible return values are for a certain Variable can be found in the MIB file.

1.6   BARCO-ME-DC-TI-MON

Information which can be pulled from the system

Variable	Description
tempInterfaceBoard	The temperature on the Cinema Front end Interface board (in degrees Celcius)
inputSelection	The input selected in the Cinema Front
testPatternMode	Indicates of the test pattern mode is active or not.
testPatternSelection	In case a test pattern is selected, indicates if it is active or not.
imageWidth	The width of the active area.(PCF data)
imageHeight	The height of the active area. (PCF Data)
imageAspectRatio	The aspect ratio of the active area. (PCF Data)
processingPath	The internal processing path. (Cinema-Standard)
anamorphicFactor	The anamorphic factor used (Screen Data)
dmdWidth	The width of the DMD
dmdHeight	The height of the DMD v
ersionTable	A table with all individual Cinema Front End software and firmware versions
summaryStatus	The summary status of the Cinema Front End
interfaceBoardStatus	The status of the interface board status. If this status is Not OK, also the summaryStatus will be set to Not OK.
processorBoardStatus	The status of the processor board. If this status is Not OK, also the summaryStatus will be set to Not OK.
TIPackageVersion	The package version of the Cinema Front End.

Notification events or traps

Varialble	Description
systemFail	This trap has a critical severity and is sent the moment of detecting a failure in the summary status of the Cinema Front End. The trap will be resent every time the projector is switched on.

1.7   BARCO-ME-DC-PROJ-MON-MIB

Information which can be pulled from the system

Varialble	Description
serialNumber	The serial number of the projector.
status	The projector status (Lamp – power on).
runTime	The projector runtime in hours
lampSerialNumber	The lamp serial number
lampArticleNumber	The lamp article number
lampStatus	The lamp status: on/off
lampMode	The Lamp mode: CLO mode or not.
lampStrikes	The number of lamp strikes
lampPower	The actual lamp power
lampCurrent	The actual lamp current
lampRunTimeTable	Table with lamp runtime entries (current, maximum, maximum warning , …)
versionTable	A table with all individual component version information. barcoPackageVersion The package version information of the projector. projWarnings The actual number of projector warnings (not on DP3000, DP100, DP90) projErrors The actual number of projector errors (not on DP3000, DP100, DP90)
barcoPackageVer-sion	The package version information of the projector.
projWarnings	The actual number of projector warnings (not on DP3000, DP100, DP90)
projErrors	The actual number of projector errors (not on DP3000, DP100, DP90)

Notification events or traps

Varialble	Description
waterCoolingFail	This trap has a critical severity and is sent the moment of detecting a failure in the cooling system. The trap will be resent every time the projector is switched on.
authenticationViola-tion	This has a critical severity and is sent the moment of detecting an unauthorized access to the card cage (also called Elcabox'). The trap will be resent every time the projector is switched on.
lampRunTimeWarn-ing	This trap has a warning severity and is sent the moment of exceeding the run time mentioned in the lampRunTime table by index 2.This time corresponds with the maximum run time minus a certain amount of time. The trap will be resent every time the lamp is switched on and at the latest until the lampRunTimeAlarm occurs.
lampRuntimeAlarm	This trap has a critical severity and is sent the moment of exceeding the run time mentioned in the lampRunTime table by index 3. This time corresponds with the maximum run time minus a very limited amount of time which is default 0h. i.e. By default the alarm is triggered the moment that the lamp run time reaches its maximum. The trap will be resent every 30 minutes.
lampOffByProjector	This trap has a critical severity and is sent the moment the projector had to turn off the lamp due to an unexpected event. The trap will be resent every 30 minutes. (not on DP3000, DP100, DP90)
lampNoStrike	This trap has a critical severity and is sent the moment the lamp is detected not to have striked. This means the lamp should be On but is actually Off. The trap will be resent every 30 minutes. (not on DP3000, DP100, DP90)
dowserNotOpen	This trap has a critical severity and is sent the moment the dowser is detected not to have opened correctly. This means the dowser should be Open but is actually Closed or Half-Closed.The trap will be resent every 30 minutes. (not on DP3000, DP100, DP90)
globalFailure	This trap has a critical severity and is sent the moment : • the projector had to turn off the lamp due to an unexpected event - or the lamp is detected not to have striked • the dowser is detected not to have opened correctly The trap will be resent every 30 minutes. (not on DP3000, DP100, DP90)

1.8   BARCO-ME-DC-DP100-MON-MIB

 Holds specific information for DP100 and DP3000.

Information which can be pulled from the system

Varialble	Description
temperatureTable	A table of temperature entries, which hold the current temperature of a component and diagnostics of the current temperature and its limits.
voltageTable	A table of voltage entries, which holds the current voltage of a component and diagnostics of the current voltage and its limits.
fanSpeedTable	A table of fan speed entries, which hold the current fan speed of a component and diagnostics of the current temperature and its limits.
presetTable	A table of presets, which holds the presets/macros that are linked to a preset button.
presetActive	The current active preset/macro. lensStatus The status of the anamorphic lens.
versionTable	A table with all individual component version information.

Notification events or traps

Varialble	Description
temperatureFail	This trap has a critical severity and is sent the moment of exceeding one of the temperature boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)
voltageViolation	This has a critical severity and is sent the moment of exceeding one of the voltage boundaries. Details could be found by getting the eventDetail object.The trap will be resent every time the projector is switched on. (**see table below for details)
fanSpeedFail	This trap has a major severity and is sent the moment of exceeding one of the fan speed boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)
exhaustFail	This trap has a major severity and is sent the moment that the exhaust is not free. The trap will be resent every time the projector is switched on.

Voltages which can be read

Voltage	Min	Max	Remarks
+TEC	8	14	
Lamp Fan Cathode	12	26	Fan 2
Lamp Fan Anode	12	26	Fan 1
Lamp Fan Top	12	26	Fan 0
Elek Fans	12	26	Fan 3
+5V	4.5	5.5	
+3V3	3	3.63	
+24V	22	26	
+12V Acsar2	10	14	
+12V	10.5	13.5	
++5V	4.50	5.5	+5V STANDBY
++12v	10	20	+12V STANDBY

Temperatures which can be monitored

Temperature	Min	Max	°C
Rack	1	40	
Lamp House	1	65	
Heatsink SMPS2 Sec	0	80	
Heatsink SMPS2 Prim	0	80	
Heatsink SMPS1 Sec	0	80	
Heatsink SMPS1 Prim	0	80	
Heatsink PFC	0	80	

Temperature	Min	Max	°C
Elcabox	0	50	
DMD Red	10	60	
DMD Green	10	60	
DMD Blue	10	60	
Ambient	1	40	

Fan speeds which can be monitored

Fan speed	Min	Max	RPM
Fan start pulse generator	2000	5000	
Fan sealing	2000	5000	
Fan lamp top	1600	3500	
Fan lamp cahtode	1600	3500	
Fan lamp anode	1600	3500	
Fan cold mirror top	2000	5000	
Fan cold mirror bottom	2000	5000	
Fan 4 elcabox	2000	5000	
Fan 3 elcabox	2000	5000	
Fan 2 elcabox	2000	5000	
Fan 1 elcabox	2000	5000	

1.9   BARCO-ME-DC-DP2000-MON-MIB

Holds specific information for DP1200, DP1500 and DP2000.

Information which can be pulled from the system

Varialble	Description
temperatureTable	A table of temperature entries, which hold the current temperature of a component, the minimum and maximum temperature, the minimum and maximum warning temperature, and diagnostics of the current temperature and its limits.(**see table below for details)
voltageTable	A table of voltage entries, which holds the current voltage of a component , the minimum and maximum voltage, the minimum and maximum warning voltage, and diagnostics of the current voltage and its limits. (**see table below for details)
fanSpeedTable	A table of fan speed entries, which hold the current fan speed of a component , the minimum and maximum fan speed, the minimum and maximum warning fan speed , and diagnostics of the current fan speed and its limits. (**see table below for details)
presetTable	A table of presets, which holds the presets/macros which are linked to a preset button.
presetActive	The current active preset/macro.

Notification events or traps

Varialble	Description
temperatureFail	This trap has a critical severity and is sent the moment of exceeding one of the temperature boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)
temperatureWarning	This trap has a warning severity and is sent the moment of exceeding one of the temperature boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)

Varialble	Description
voltageFail	This has a critical severity and is sent the moment of exceeding one of the voltage boundaries. Details could be found by getting the eventDetail object.The trap will be resent every time the projector is switched on. (**see table below for details)
voltageWarning	This trap has a warning severity and is sent the moment of exceeding one of the voltage boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)
fanSpeedFail	This trap has a major severity and is sent the moment of exceeding one of the fan speed boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)
fanSpeedWarning	This trap has a warning severity and is sent the moment of exceeding one of the fanspeed boundaries. Details could be found by getting the eventDetail object. The trap will be resent every time the projector is switched on. (**see table below for details)

Temperatures which can be monitored

	Temperature °C	Min	Warning	Max	°C remark
1	ambient	10	45	50	Degree Celsius
2	block front		60	65	Light Engine
3	dmd red	10	60	65	
4	dmd red front	10	70	75	
5	block red		80	85	
6	dmd green	10	60	75	
7	dmd green front	10	70	85	
8	block green		80	65	
9	dmd blue	10	60	75	
10	dmd blue front	10	70	85	
11	block blue		80	100	
12	lamp		95	100	
13	pfc heatsink		90	100	Power Supply
14	smps primary heatsink		90	100	
15	smps secondary heatsink		90	100	
16	light pipe		90	65	Light Engine
17	engine air		60	255	
18	lps 0x20 rectifier	0	105	255	Lamp power supply
19	lps 0x20 pfc heatsink	0	100	255	
20	lps 0x20 lps heatsink	0	105	255	
21	lps 0x20 trafo	0	110	255	
22	lps 0x20 ambient	0	75	255	
23	lps 0x22 rectifier	0	105	255	
24	lps 0x22 pfc heatsink	0	100	255	
25	lps 0x22 lps heatsink	0	105	255	
26	lps 0x22 trafo	0	110	255	
27	lps 0x22 ambient	0	75	255	
28	lps 0x28 rectifier	0	105	255	
29	lps 0x28 pfc heatsink	0	100	255	
30	lps 0x28 lps heatsink	0	105	255	
31	lps 0x28 trafo	0	110	255	
32	lps 0x28 ambient	0	75	255	

Voltages which can be read

	Voltages	Min	Warning	Max	Volt. remark
1	+12	11	12	13	
2	+30	28	30	31.75	
3	++5	4.5	5	5.5	
4	tec	6	12	16	0 - lamp off
5	tec red	0	varible	14	0 - lamp off
6	tec front red	0	varible	14	0 - lamp off
7	tec green	0	varible	14	0 - lamp off
8	tec front green	0	varible	14	0 - lamp off
9	tec blue	0	varible	14	0 - lamp off
10	tec front blue	0	varible	14	0 - lamp off
11	cold mirror fan	10	22	31.75	0.25 - lamp off
12	elcabox fan	10	24	31.75	
13	engine fan	10	16	31.75	
14	heat exchanger fan	10	22	31.75	0.25 - lamp off
15	lamp anode fan	10	26	31.75	
16	lamp cathode fan	10	26	31.75	
17	lamp rear fan	10	22	31.75	0 - lamp off
18	smps fan	10	24	31.75	
19	+12 fib	11	12	13	
20	motor	10	14	16	
21	pump	14	20	31.75	0.25 - lamp off

Fan speeds which can be monitored

	Fan Speed RPM	Min	Warning	Avg	RPM - Remarks
1	cold mirror fan	600	100	3000	0 - lamp off
2	elcabox fan	600	1000	2800	
3	engine	600	1000	2800	
4	heat exchanger fan	600	1000	3000	0 - lamp off
5	lamp anode fan	600	750	3000	1000 - lamp off
6	lamp cathode fan	600	750	3000	
7	lamp rear fan	600	1000	3000	0 - lamp off
8	smps fan 1	600	1000	3800	
9	smps fan 2	600	1000	3800	