



# SNMP in the Real World:

## Experiences of Using an Ancient Protocol in a Modern Broadcast Facility

Tony Peterle, Worldcast Systems Inc.

# SNMP and Me: Questions to answer

- What is SNMP?
- How does it apply to me?
- How are others using it?
- How do I get started?

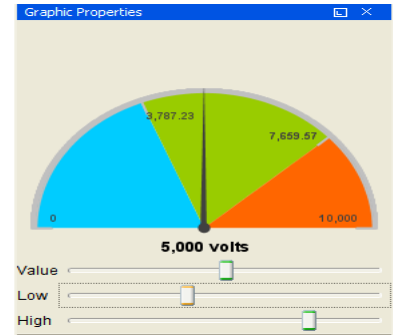
# SNMP and Me: Questions to answer

## Simple Network Management Protocol

- **What is SNMP?**
  - Standardized protocol for query and response of data points (Objects)
- **How does it apply to me?**
  - Querying equipment is called an SNMP Manager
- **How are others using it?**
  - Target equipment is called an SNMP Agent
- **How do I get started?**
  - Objects are designated by a unique number called the Object Identifier, or OID  
: := 1.3.6.1.4.1.5299.15.12.1.11.1.1.8

# SNMP functions

- SNMP commands to retrieve and control data in target device
  - GET command to query a data point and display results
  - SET command to change a data point – control functions in target



**GET**



TCP-IP



Target equipment



# Display

Data and control functions obtained using SNMP can be integrated with other data and controls from traditional I/O or from serial data.

**OUTPUT | SIGNAL PATH | FACILITIES | ENGINEERING**

TX 1 Channel 7 WILLIS	TX 2 Channel 7 WILLIS	Channel 44 WILLIS	Channel 44 HANCOCK
% Out... 0.0 %	% Out... 0.0 %	% Output 67.0 %	% Output 0.0 %
Refl... 0 W	Refl Pwr 1 W	47,510.0 W Output Power	0.00 W Rfl Pwr
0 W Output 1.00 VSWR	0 W Output 1.00 VSWR	20,150 W HPA 1 25,280 W HPA 2 25,380 W HPA 3	0 W Output 1.00 VSWR
0 % Cab 1 0 % Cab 2	0 % Cab 1 0 % Cab 2	Fault Warning Fault Warning Fault Warning	

**Ch 7 Transmitter CONTROL**

TX 1	TX 2
<input type="checkbox"/> CH 7 TX ON	<input type="checkbox"/> CH 7 TX 2 ON
<input type="checkbox"/> CH 7 TX 1 OFF	<input type="checkbox"/> CH 7 TX 2 OFF
<input type="checkbox"/> TX1 RAISE PWR	<input type="checkbox"/> TX2 RAISE PWR
<input type="checkbox"/> TX1 LOWER PWR	<input type="checkbox"/> TX2 LOWER PWR
<input checked="" type="checkbox"/> TX1 Exc A ON	<input type="checkbox"/> TX 2 has ONLY Exciter A
<input type="checkbox"/> TX1 Exc B ON	

**Ch 44 Transmitter CONTROL**

<input type="checkbox"/> Ch44 STANDBY	<input checked="" type="checkbox"/> Ch 44 ON
<input checked="" type="checkbox"/> Exciter A ON	<input type="checkbox"/> RAISE PWR
<input type="checkbox"/> Exciter B ON	<input type="checkbox"/> LOWER PWR
<input type="checkbox"/> HPA1 Standby	<input checked="" type="checkbox"/> HPA 1 HV ON
<input type="checkbox"/> HPA2 Standby	<input checked="" type="checkbox"/> HPA 2 HV ON
<input type="checkbox"/> HPA3 Standby	<input checked="" type="checkbox"/> HPA 3 HV ON
<input checked="" type="checkbox"/> HPA 2 & 3 On Air	

**Ch 44 Hancock CONTROL**

<input type="checkbox"/> HANCOCK TX ON
<input type="checkbox"/> HANCOCK TX OFF
<input type="checkbox"/> RAISE POWER
<input type="checkbox"/> LOWER POWER
<input checked="" type="checkbox"/> Exciter A ON
<input type="checkbox"/> Exciter B ON
<input type="checkbox"/> CH 44 ON (Wired)
<input type="checkbox"/> CH 44 OFF (Wired)

Select PATH A | **Path "A" Is ACTIVE** | Select PATH B

Ch44 MAIN ANTENNA ACTIVE |  Ch 44 ON AIR FROM WILLIS TOWER

**Willis Tower Site**

**FIRE SYSTEM**

- OK (NO Halon Release)
- OK (NO Alarm)
- OK (System Normal)

ComEd NORMAL

Line Voltage OK

All Room Temps OK

Entry SECURE

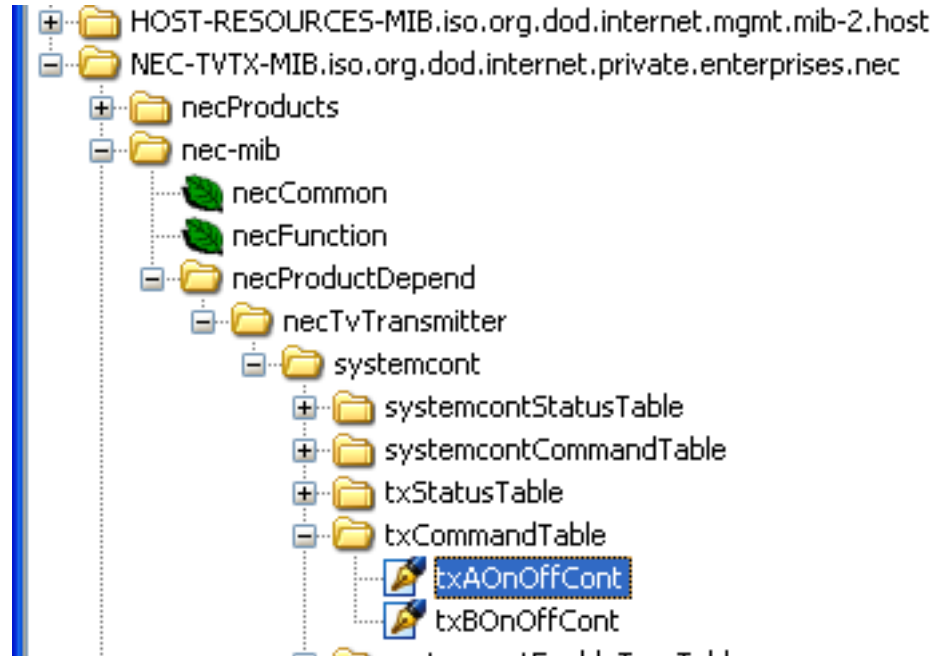
Twr Lights OK

Generator Fuel OK

**WorldCast Systems**  
delivered > transmitted > monitored

# SNMP: Menu of Objects (MIB)

▲ The Management Information Base, or MIB, is a directory tree 'menu' of the OIDs available on a particular SNMP Agent device.



# SNMP and Me: Questions to answer

Think of SNMP as just another connection to the target gear

- What is SNMP?

- Some data will be gathered with traditional hard-wired connections
- Some data is gathered through advanced connections (serial)
- Some data gathered by SNMP

- How does it apply to me?

- How are others using it?





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Systems  
deliver > transmit > monitor

# Lots of things speak SNMP



Broadcast



IT Gear



UPS systems



HVAC systems



IP links



Monitors



Codecs



Facility Control





**WorldCast**  
Systems  
deliver > transmit > monitor

# Site-to-site communications



10001



# SNMP and Me: Questions to answer

-  **What is SNMP?**
-  **Does it apply to me?**

- **How are others using it?**
- **How do I get started?**



Steve Frick  
Clear Channel  
San Diego



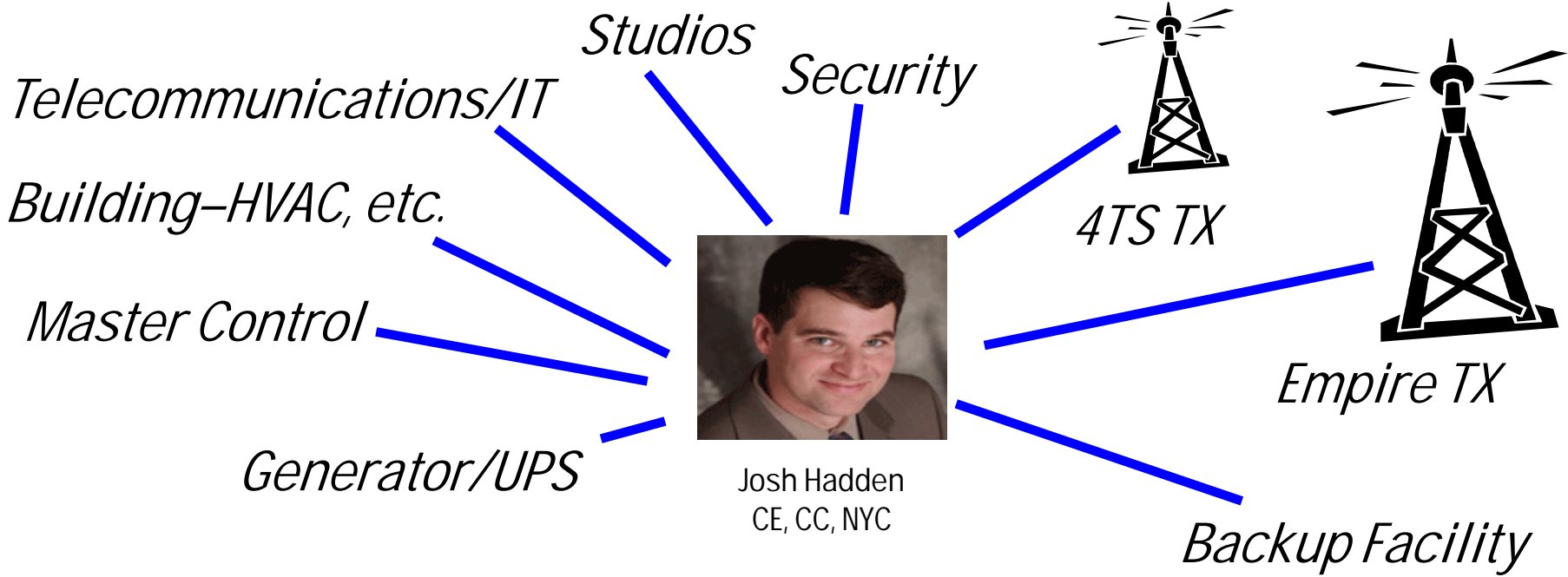
Doug Irwin  
Clear Channel  
Los Angeles



Brett Gilbert  
Clear Channel  
Tulsa

Meet the SNMP team

# Real World #1



Josh Hadden  
CE, CC, NYC



1. Call Times Square transmitter

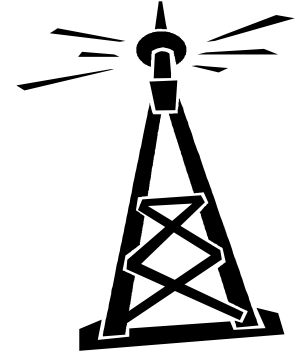
- Ensure that coax switch is set to antenna
- Ensure that an audio source is selected and play.
- Turn on transmitter
- Take a set of readings to verify operation.
- Hang up.



*4TS TX*

2. Call Empire transmitter

- Turn off transmitter auto switch
- Turn off FM transmitter
- Turn off HD transmitter
- Take a set of readings to verify everything is off.
- Acknowledge alarms that site has no RF and audio.
- Hang up

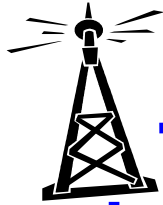


*Empire TX*

3. Repeat this for the other four stations.



*Empire TX*

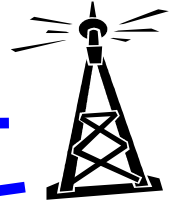


Control  
point

Ping, SNMP data and  
commands

## SNMP – an easier way

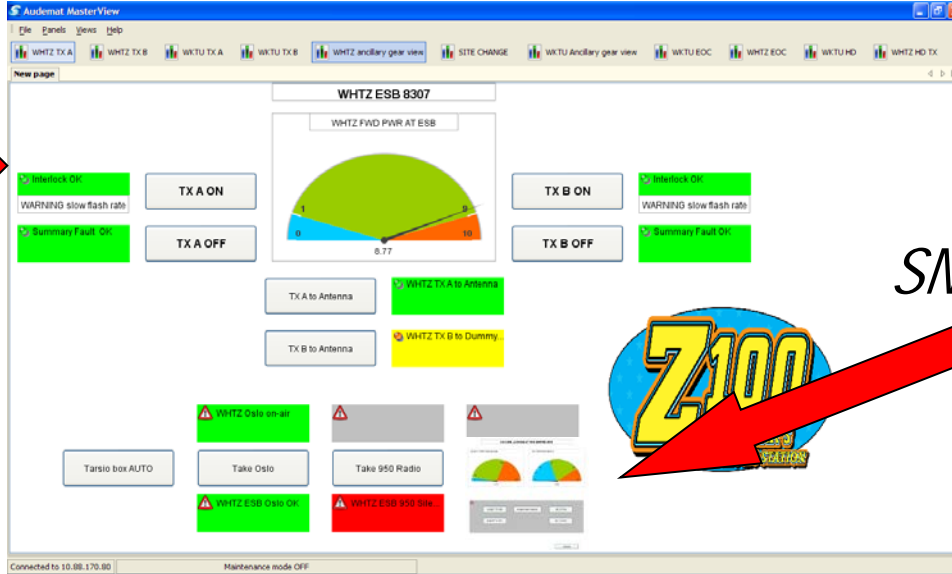
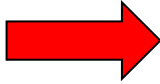
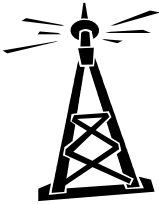
*4TS TX*



- a. Verify coax switch positions.
  - b. Turn on transmitter
  - c. Verify all critical readings -TPO, VSWR, faults, etc.
  - d. Mask alarms at site going off line.
  - e. Shut off HD transmitter
  - f. Shut off FM transmitter
  - g. Contact STUDIO relio and verify presence of audio and RF.
  - h. After five minutes verify that PPM codes are still present.
  - i. Repeat for each station:
1. Contact to any Relio
  2. Enable transmitter control  
(to prevent accidental button pushes)
  3. Select which station(s) to switch.

# Sharing controls between sites

*Empire TX*



WHTZ ESB 8307  
WHTZ FWD PWR AT ESB  
0.77

TX A ON TX A OFF TX B ON TX B OFF

Interlock OK  
WARNING slow flash rate  
Summary Fault OK

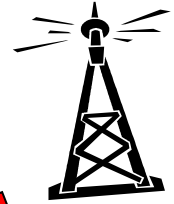
TX A to Antenna WHTZ TX A to Antenna  
TX B to Antenna WHTZ TX B to Dummy

WHTZ Data on-air  
WHTZ ESB Oslo OK  
WHTZ ESB 950 Site

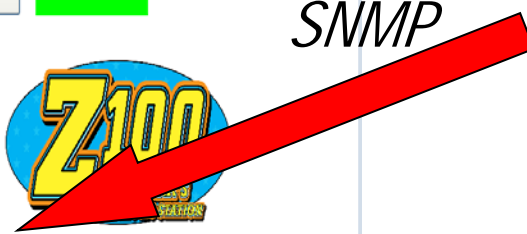
Tarsis box AUTO Take Oslo Take 950 Radio

Connected to 10.88.170.80 Maintenance mode OFF

*4TS TX*



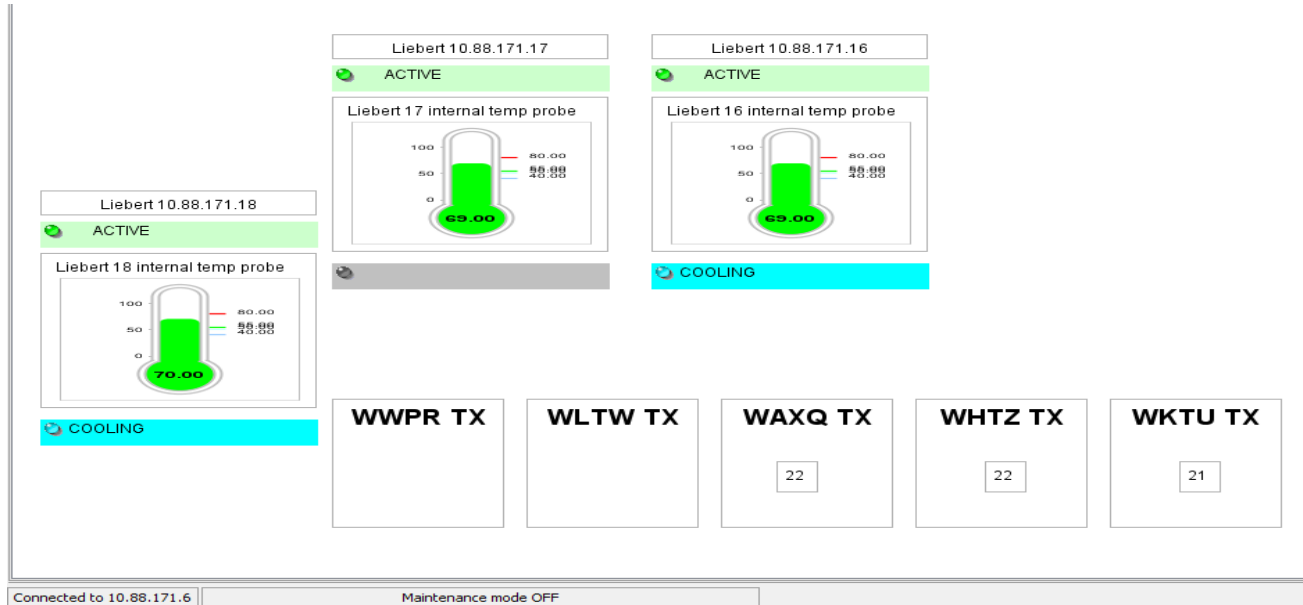
*SNMP*





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deliver > transmit > monitor

# Liebert HVAC system – data from SNMP



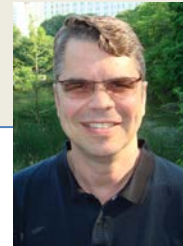
# The Doomsday script

“So last Friday afternoon at 340 pm...I get an e-mail and phone call from one of our 4TS Relios. I interpreted its messages, somewhat incredulously...

Turns out that the Z100 transmitter on-air at ESB crashed because some water had leaked from the ceiling above it. The station was off—the ‘auto site-switch’ script running at 4TS did its thing. This was the first time it actually ever got called in to service.

No one here (aside from Engineering) even knew what happened. ”

Doug Irwin  
Clear Channel  
Los Angeles



- Doug Irwin





## Real World #2



Garry Shults  
WLS-TV  
Chicago

M

[CONTROL OUTPUT](#) | [SIGNAL PATH](#) | [FACILITIES](#) | [ENGINEERING](#)

**WILLIS SITE CH 44 TRANSMITTER**  
**Make certain you understand what you are doing prior to activating ANY controls on this page!**

2.90 % Exciter A EVM	36.00 % Exciter B EVM
30.0 dB Exciter A SNR	28.10 dB Exciter B SNR

**MODE CONTROLS**

Green LED Indicates current Status

- Switch To HPA 1 ONLY Online
- Switch To HPA 2 ONLY Online
- Switch To HPA 3 ONLY Online
- Switch To HPA 1 & 2 ONLY Online
- Switch To HPA 1 & 3 ONLY Online
- Switch To HPA 2 & 3 ONLY Online
- Switch To HPA 1 & 2 & 3 OnLine

**ANTENNA CONTROLS and STATUS**

- Switch to Main Antenna
- Switch to Aux Antenna

✓

**HPA ON/OFF Controls**

<input type="radio"/> HPA 1 Standby	<input checked="" type="radio"/> HPA 1 HV ON
<input type="radio"/> HPA 2 Standby	<input checked="" type="radio"/> HPA 2 HV ON
<input type="radio"/> HPA 3 Standby	<input checked="" type="radio"/> HPA 3 HV ON

HPA Warm-Up TIMER Status	HPA READY Status
<input checked="" type="checkbox"/> HPA 1 Timer READY	<input checked="" type="checkbox"/> HPA 1 Ready
<input checked="" type="checkbox"/> HPA 2 Timer READY	<input checked="" type="checkbox"/> HPA 2 Ready
<input checked="" type="checkbox"/> HPA 3 Timer READY	<input checked="" type="checkbox"/> HPA 3 Ready

HPA FAULTS & ON-LINE Status	NOTE:
<input checked="" type="checkbox"/> HPA 1 Shows NO Fault	Faults <u>only</u> display for an HPA with a green LED indicating it is On-Line. An Off-Line HPA's LED is dark, <u>does not</u> show faults and will not trigger Summary Alarms.
<input checked="" type="checkbox"/> HPA 2 Shows NO Fault	
<input checked="" type="checkbox"/> HPA 3 Shows NO Fault	

NOTE: The HPA will only stay in Standby for 20 minutes unless put into HPA HV ON (Beam ON). Otherwise it will go back into BG Heat. LED is on in "Standby" or "Hv" but not both.

To change modes, ALL selected HPA's which will be in the new pattern must have both TIMER and READY status LED's GREEN. Otherwise, NO SWITCH WILL OCCUR!

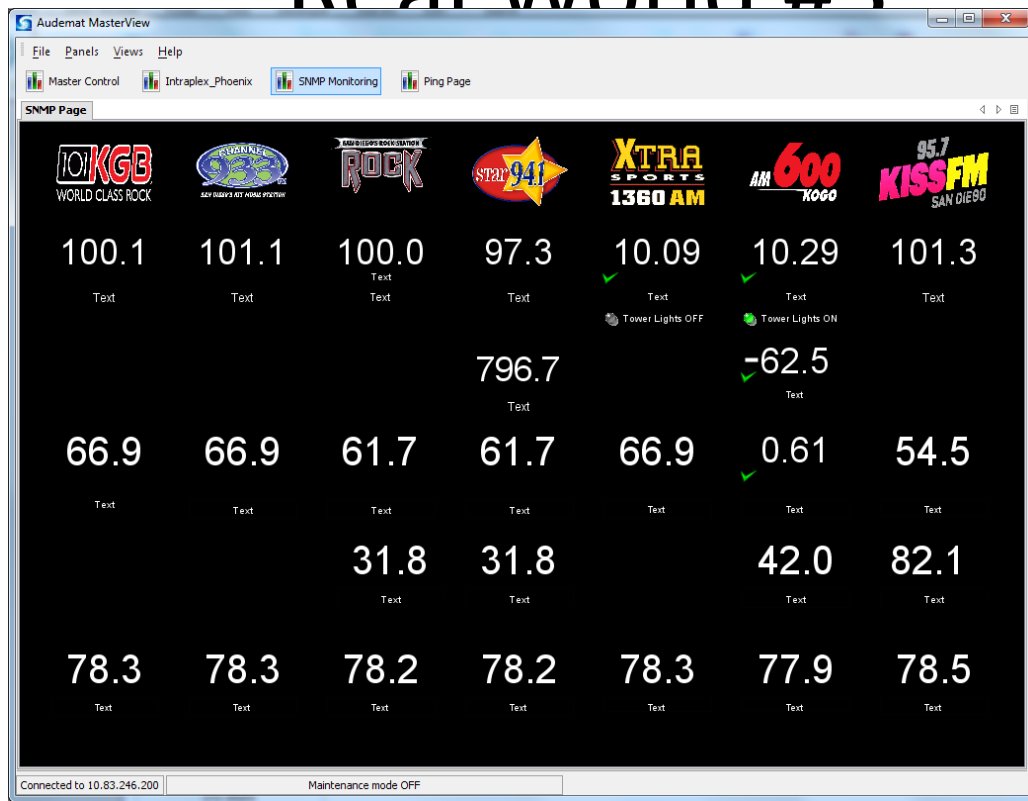
NOTE: Operating in HPA 1&2&3 Mode is possible **ONLY** on the Main Antenna. You **MUST** switch to another HPA mode **BEFORE** switching to the Aux Antenna.

Individual HPA Power Adjust Green indicates HPA is in Remote
<span>HPA 1 Pwr Raise</span> <span>HPA 2 Pwr Raise</span> <span>HPA 3 Pwr Raise</span>

# Real World #3



Brett Gilbert  
Clear Channel  
Tulsa



The screenshot shows the Audemat MasterView software interface. The window title is "Audemat MasterView" and it has a menu bar with "File", "Panels", "Views", and "Help". Below the menu bar are several panels: "Master Control", "Intraplex\_Phoenix", "SNMP Monitoring", and "Ping Page". The main display area is titled "SNMP Page" and features a grid of radio station logos and their corresponding frequencies. The stations and their frequencies are:

Station Logo	Frequency	Status
101.1 KGB WORLD CLASS ROCK	100.1	Text
101.1 KGB WORLD CLASS ROCK	101.1	Text
100.0 KGB WORLD CLASS ROCK	100.0	Text
97.3 KGB WORLD CLASS ROCK	97.3	Text
10.09 XTRA SPORTS 1360 AM	10.09	Text (Tower Lights OFF)
10.29 AM 600 KOGO	10.29	Text (Tower Lights ON)
101.3 95.7 KISS FM SAN DIEGO	101.3	Text
	796.7	Text
66.9	66.9	Text
66.9	66.9	Text
61.7	61.7	Text
61.7	61.7	Text
66.9	66.9	Text
0.61	0.61	Text
54.5	54.5	Text
	31.8	Text
	31.8	Text
	42.0	Text
	82.1	Text
78.3	78.3	Text
78.3	78.3	Text
78.2	78.2	Text
78.2	78.2	Text
78.3	78.3	Text
77.9	77.9	Text
78.5	78.5	Text

At the bottom of the window, it shows "Connected to 10.83.246.200" and "Maintenance mode OFF".

Steve Frick  
Clear Channel  
San Diego

# SNMP and Me: Questions to answer

- **What is SNMP?**
  - Acquire some basic software tools
    - Advanced text editor
    - MIB browser
- **How does it apply to me?**
  - Identify target SNMP equipment on your network
    - Manufacturer data, brochures
- **How are others using it?**
  - Get the MIB file
- **How do I get started?**
  - Choose some data Objects, test GET and SET commands, see what happens!

# SNMP tools – Notepad++



The screenshot shows the Notepad++ website layout. On the left is a vertical orange sidebar with a green frog logo holding a pencil and the text 'Notepad++'. Below the logo are links for 'home', 'download', 'news', and 'online help'. At the top of the sidebar are three small circular icons and the text 'more languages'. The main content area has a dark grey background and is divided into two columns. The left column is titled 'News' and contains three news items with their dates. The right column is titled 'About' and contains two paragraphs of text.

more languages

home  
download  
news  
online help

## News

[French Presidential Election - Vote for Chuck Norris!](#)  
May 02 2012

[Notepad++ 6.1.2 released](#)  
Apr 26 2012

[France, the future country of fascism?](#)  
Apr 22 2012

[Notepad++ 6.1.1 - License \(GPL\) enhanced](#)  
Apr 17 2012

[Notepad++ 6.1 released](#)

## About

Notepad++ is a free (as in "free speech" and also as in "free beer") source code editor and Notepad replacement that supports several languages. Running in the MS Windows environment, its use is governed by [GPL](#) License.

Based on the powerful editing component [Scintilla](#), [Notepad++](#) is written in C++ and uses pure Win32 API and STL which ensures a higher execution speed and smaller program size. By optimizing as many routines as possible without losing user friendliness, [Notepad++](#) is trying to reduce the world carbon dioxide emissions. When using less CPU power, the PC can throttle down and reduce power consumption, resulting in a greener environment.



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# Why do I need an “advanced” text editor?

Let’s play “Find the Imports”!

```
#####DIVICOM-EUROPA-MIB FORCE-
INCLUDE <stdio.h> FORCE-INCLUDE <types.h> FORCE-INCLUDE <wrn/wm/snmp/engine/asn1.h> FORCE-
INCLUDE <wrn/wm/snmp/engine/mib.h> FORCE-INCLUDE <wrn/wm/snmp/engine/snmpdefs.h> FORCE-INCLUDE
<wrn/wm/snmp/engine/snmp.h> FORCE-INCLUDE <wrn/wm/snmp/engine/auxfuncs.h> FORCE-INCLUDE
<wrn/wm/snmp/vxagent/europaskel.h> FORCE-INCLUDE <wrn/wm/snmp/vxagent/europaleaf.h> -- DEFAULT
get-function-async europaControl_get -- DEFAULT next-function-async europaControl_next -- DEFAULT
get-function-async europaTrapClientEntry_get -- DEFAULT next-function-async europaTrapClientEntry_next
-- DEFAULT set-function-async europaTrapClientEntry_set -- DEFAULT test-function-async
europaTrapClientEntry_test -- DEFAULT get-function-async europaLastAlarmEntry_get -- DEFAULT
next-function-async europaLastAlarmEntry_nextDEFINITIONS ::= BEGINIMPORTS enterprises, IPAddress, Counter,
TimeTicks FROM RFC1155-SMI OBJECT-TYPE -- FROM RFC 1212 FROM SNMPv2-SMI TRAP-TYPE
FROM RFC-1215;-- Define the top of this MIB (europa, reference on CDR document)divicom OBJECT IDENTIFIER ::= {
enterprises 898 }europa OBJECT IDENTIFIER ::= { divicom 9 } DisplayString ::= OCTET STRING --
This data type is used to model textual information taken -- from the NVT ASCII character set. By convention,
objects -- with this syntax are declared as having -- size (0..255); ObjectIdentifier ::= OCTET
STRING -- It is being represented as an ObjectIdentifier rather than a -- string, with the string components
being replaced by numbers.-- Next, we will add the following section:europaControl OBJECT IDENTIFIER ::= {
europa 1 }europaCodeVersion OBJECT-TYPE SYNTAX DisplayString (SIZE(0..64)) MAX-ACCESS read-
only STATUS current DESCRIPTION "The official code version which is compiled into the code,
this is the same as the Codeversion attribute in the XML" ::= { europaControl 1 }europaCodeUser OBJECT-
TYPE SYNTAX DisplayString (SIZE(0..32)) MAX-ACCESS read-only STATUS current DESCRIPTION
"This is the user who did the build (if it is a private build) or empty if it is an official build.
This is the same as the User attribute in the XML" ::= { europaControl 2 }europaMibVersion OBJECT-
TYPE SYNTAX DisplayString (SIZE(0..32)) MAX-ACCESS read-only STATUS current DESCRIPTION
"This is the revision version of this mib. Because most revisions will be caused by additions to the
XML regtype or alarmId enumerations, we will actually be using the XML version here. If any non-
autogenerated components of the MIB change, we will explicitly bump the XML version in the schema
to track this. This is equivalent to the Xmlversion attribute in the XML." ::= { europaControl 3 }
europaAlarmLastId OBJECT-TYPE SYNTAX INTEGER MAX-ACCESS read-only STATUS current
DESCRIPTION "This is the sequence number of the last assert, remit, or transient alarm sent,
similar to what is in CSD_Alarms in the XML. This is used to resynchronize the trap management
system with the encoder. Counters wrap at 32 bits. (unsigned number)." ::= { europaControl 4 }
```



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deliver > transmit > monitor

## Divicom Europa MIB file in Notepad ++

```
49 .....  
50 DEFINITIONS ::= BEGIN  
51 .....  
52 IMPORTS  
53     enterprises, IPAddress, Counter, TimeTicks  
54     .....  
55     FROM RFC1155-SMI  
56     OBJECT-TYPE  
57     .....  
58     -- FROM RFC-1212  
59     FROM SNMPv2-SMI  
60     TRAP-TYPE  
61     .....  
62     FROM RFC-1215;  
63 -- Define the top of this MIB (europa, reference on CDR document)  
64 divicom OBJECT IDENTIFIER ::= { enterprises 898 }  
65 europa  OBJECT IDENTIFIER ::= { divicom 9 }  
66 DisplayString ::=  
67 .....  
68     OCTET STRING  
69 .....  
70 -- This data type is used to model textual information taken  
71 -- from the NVT ASCII character set. By convention, objects
```





## Net-SNMP

Current release: 5.7.1

### About

- News
- History
- Change Log
- License

### Download

### Tutorials

### Documentation

### Wiki

### Support

### Development

### Related Info/SW



A composite image of images from locations that use the Net-SNMP package. [Click here for more information.](#)

Archive Search:

Users

Search

**Simple Network Management Protocol (SNMP)** is a widely used protocol for monitoring the health and welfare of network equipment (eg. routers), computer equipment and even devices like UPSs. Net-SNMP is a suite of applications used to implement **SNMP v1**, **SNMP v2c** and **SNMP v3** using both IPv4 and IPv6. The suite includes:

SNMP uses a manager/agent architecture. Alarm messages (Traps) are sent by the agent to the manager.

# MIB Browser

iReasoning MIB Browser

File Edit Operations Tools Bookmarks Help

Address: 127.0.0.1 Advanced... OID: .1.3.6.1.4.1.119.2.3.96.41.4.1.0 Operations: Get Go

SNMP MIBs

- dummyControlCont
- systemChangeCont
- mainstbyAntSelectCont
- txStatusTable
- txCommandTable
- txAOnOffCont
- txBOnOffCont

Name/OID	Value	Type

Name	txAOnOffCont
OID	.1.3.6.1.4.1.119.2.3.96.41.4.1
MIB	NEC-TVTX-MIB
Syntax	INTEGER {txAOff(1),txAOn(2)}
Access	read-write
Status	mandatory
DefVal	
Indexes	

.iso.org.dod.internet.private.enterprises.nec.nec-mib.necProductDepend.necTvTransmitter.systemcont.txCommandTable.txAOnOffCont.0



## SNMP tools – MIB Browser

- MIB browser CAN
  - Provide an essential window into the SNMP world
  - Examine MIB files, browse to and read about all OIDs
  - Examine MIB structure, tables, traps, imports
  - WALK the MIB – test OIDs individually and en masse
  - GET data from any specific OID – see raw values
- MIB browser can (typically) NOT
  - Automatically poll Agent for data or issue SET commands
  - Notify technical personnel of parameters that exceed thresholds
  - Integrate data and readings from traditional I/O connections

# SNMP example – Nautel NV Transmitter

- SNMP ready
- Software update
- 2 MIB files
  - Nautel general
  - NV specific



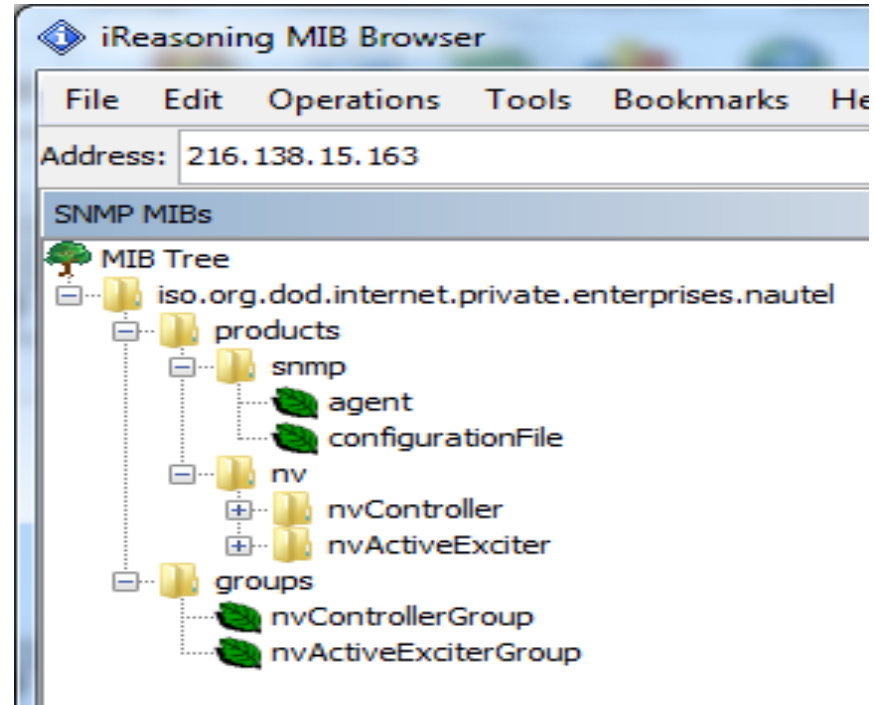
LIBERT\_GP\_REG.MIB  
NAUTEL-MIB.mib  
NAUTEL-NV-MIB.mib  
NEC Transmitter.mib

The image shows a list of MIB files. The files 'NAUTEL-MIB.mib' and 'NAUTEL-NV-MIB.mib' are circled in red.

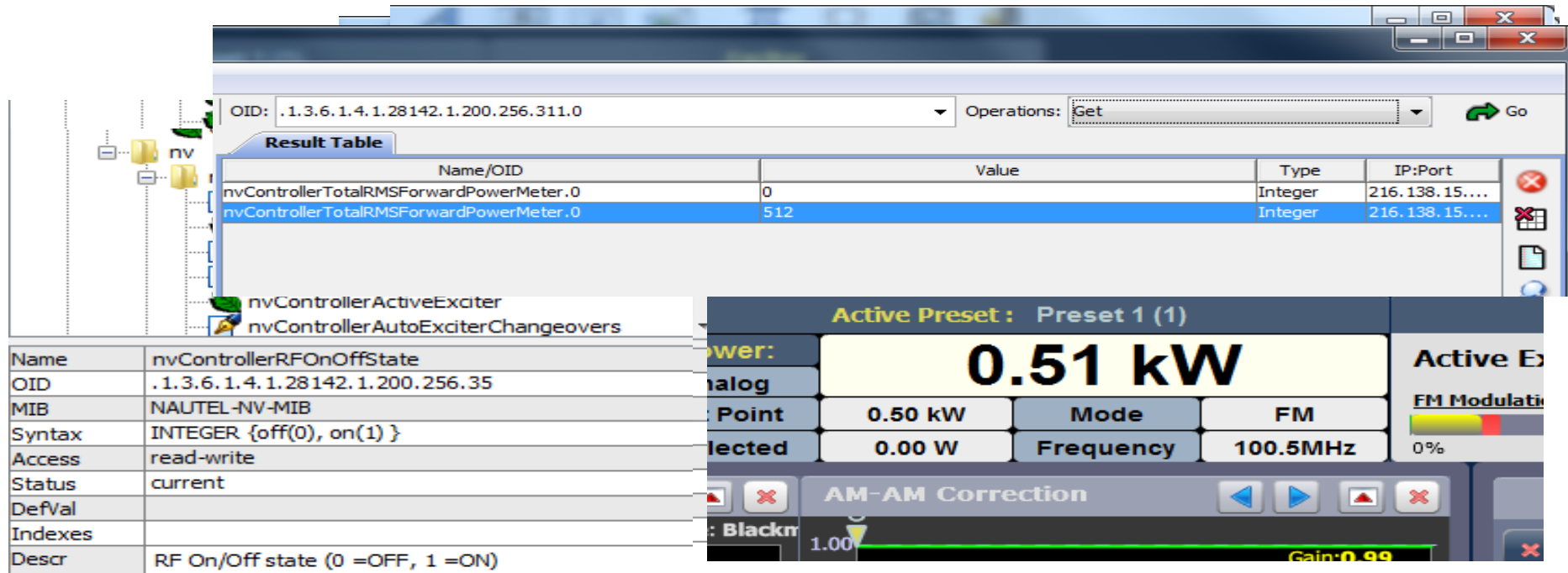


# Nautel NV MIB file in browser

- “Easy” MIB
  - No tables
  - No traps
- Two object groups
  - Controller
  - Active Exciter



# Nautel NV transmitter – GET single OID



The screenshot shows a network management interface with a 'Result Table' and a transmitter status panel.

**OID Retrieval Interface:**

- OID: .1.3.6.1.4.1.28142.1.200.256.311.0
- Operations: Get
- Go button

**Result Table:**

Name/OID	Value	Type	IP:Port
nvControllerTotalRMSForwardPowerMeter.0	0	Integer	216.138.15....
nvControllerTotalRMSForwardPowerMeter.0	512	Integer	216.138.15....

**Transmitter Status Panel (Active Preset: Preset 1 (1)):**

- Power: **0.51 kW**
- Point: 0.50 kW
- Mode: FM
- Frequency: 100.5MHz
- Gain: 0.99

**OID Details Table:**

Name	Value
nvControllerRFOnOffState	0

**OID Metadata Table:**

Field	Value
OID	.1.3.6.1.4.1.28142.1.200.256.35
MIB	NAUTEL-NV-MIB
Syntax	INTEGER {off(0), on(1)}
Access	read-write
Status	current
DefVal	
Indexes	
Descr	RF On/Off state (0 =OFF, 1 =ON)

iReasoning MIB Browser

File Edit Operations Tools Bookmarks Help

Address: 216.138.15.163 Advanced... OID: .1.3.6.1.4.1.28142.1.200.1025.1583.0 Operations: Walk Go

SNMP MIBs

products

### Result Table

Name/OID	Value	Type	IP:Port
nvControllerExternalBarAlarm.0	on (1)	Integer	216.138.15....
nvControllerSummaryAlarm.0	on (1)	Integer	216.138.15....
nvControllerPlus5AMeter.0	549	Integer	216.138.15....
nvControllerPlus5BMeter.0	553	Integer	216.138.15....
nvControllerPlus15AMeter.0	151	Integer	216.138.15....
nvControllerPlus15BMeter.0	150	Integer	216.138.15....
nvControllerMinus15AMeter.0	-158	Integer	216.138.15....
nvControllerMinus15BMeter.0	-157	Integer	216.138.15....
nvControllerPlus12AMeter.0	127	Integer	216.138.15....
nvControllerPlus12BMeter.0	127	Integer	216.138.15....
nvControllerAmbientTemperature...	39	Integer	216.138.15....
nvControllerRFDriveMeter.0	0	Integer	216.138.15....
nvControllerForwardPowerMeter.0	0	Integer	216.138.15....
nvControllerReflectedPowerMeter.0	0	Integer	216.138.15....
nvControllerTotalRMSForwardPow...	0	Integer	216.138.15....
nvControllerAnalogForwardPower...	0	Integer	216.138.15....
nvControllerDigitalForwardPower...	0	Integer	216.138.15....

Name  
OID  
MIB

Syntax INTEGER (0..1)  
Access read-write  
Status current  
DefVal

.iso.org.dod.internet.private.enterprises.nautel.products.nv.nvActiveExciter.nvActiveExciterNoExternal10MHzAlarm.0

## SNMP example #1 – Ceragon Fibear IP link

- Simple device
- Simple MIB?
- NOT
  - MIB file is 288 pages!



# Advantages of using SNMP in your facility control plan

- ④ Save time and effort – connect with and control remote equipment using existing network connections
- ④ Monitor and control vital IT systems – servers, routers, firewalls, switches, etc.
- ④ Broadcast equipment increasingly supporting SNMP
  - ④ Harris ATSC transmitters, Nautel NV and VS, more on the way (ZX10)
- ④ Monitor and control a greater variety of equipment
  - ④ Include UPS, HVAC, Security systems, office equipment in your overall plan
- ④ Achieve greater detail of information
  - ④ 100s of data points, detect small failures before they become big ones
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**WorldCast**  
**Systems**  
deliver > transmit > monitor

Thank you for your time!



Tony Peterle

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<http://www.Worldcastsystems.com>

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