

Technical documentation

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Using SNMP with CC24, iCSmini and SHR

Document history

Version	Date	Major changes
1.0	2019-11-13	Initial Version

Disclaimer / Copyright

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The information in this manual is subject to change without notice. We take no responsibility for any mistake in the document. We reserve the right to make changes in the product design without reservation and without notification to the users. We decline all responsibility for damages and injuries caused by an improper use of the device.

Important Notes

It is strongly recommended to read the operator´s manual before operation. To avoid injury of users it is not allowed to open the unit. There are no parts which can be maintained by users inside of the unit. Opening the unit will void the warranty.

We decline all responsibility for damages and injuries caused by an improper use of the module. It is strongly recommended to read the operators manual before operation.

Description of the safety instructions

WARNING!



WARNING!

The non-observance of the advices marked as “Warning!” could lead to possible injury or death.

CAUTION!



CAUTION!

Advices marked as “Caution!” describe actions to avoid possible damages to property.

INFORMATION



INFORMATION

Advices marked as “Information” give important information.

Qualification of personnel

A skilled person is someone who is able to assess the work assigned to him, recognize possible dangers and take suitable safety measures on the basis of his technical training, his knowledge and experience as well as his knowledge of the relevant regulations. A specialist must comply with the relevant technical regulations and have the necessary specialist knowledge.

General safety instructions

We decline all responsibility for damages and injuries caused by an improper use of the module. It is strongly recommended to read the operators manual before operation.

We do not accept any liability for damage and its consequences which may arise from improper use of our equipment. For this reason, these operating instructions must be read carefully before initial operation!

- Observe the valid regulations for accident prevention and environmental protection.
- Observe the safety regulations of the country in which the product is used.
- Observe the technical data and environmental conditions specified in the product documentation.
- You may only put the product into operation after it has been established that the high-voltage device complies with the country-specific regulations, safety regulations and standards of the application.
- There are no user serviceable parts inside the unit.
- The high-voltage power supply unit may only be installed by qualified personnel.

Important security information

WARNING!



WARNING!

This device generates high voltages or is part of or attached to high voltage supplying systems. High voltages are dangerous and may be fatal.

USE CAUTION WHILE WORKING WITH THIS EQUIPMENT.
BE AWARE OF ELECTRICAL HAZARDS.

Always follow at the minimum these provisions:

- High voltages must always be grounded
- Do not touch wiring or connectors without securing
- Never remove covers or equipment
- Always observe humidity conditions
- Service must be done by qualified personnel only

WARNING!



WARNING!

RAMP DOWN VOLTAGES !

Before insertion or removal of crate controller, please make sure, that all voltages are ramped down, modules are switched off and power cord is disconnected.

ATTENTION!



ATTENTION!

CHECK COMPATIBILITY

Please Check compatibility list first.

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1 Introduction

SNMP (Simple Network Management Interface) is a network protocol to control and monitor remote computers. It was originally developed for administration tasks, but can as well be used for industrial control. The station that is controlled resp. monitored runs a SNMP server, the controlling station uses the SNMP client.

The protocol allows a performant and resource efficient communication to the remote device. Client applications are available for a wide range of computers and operating systems.

2 iseg SNMP server

The iseg SNMP server is based on the net-snmp project and was developed as compatible replacement for the WIENER MPOD SNMP server. The iseg SNMP server is part of the iseg Communication Server iCS-2 running under Linux on a CC24 or iCSmini.

3 SNMP namespace configuration

INFORMATION

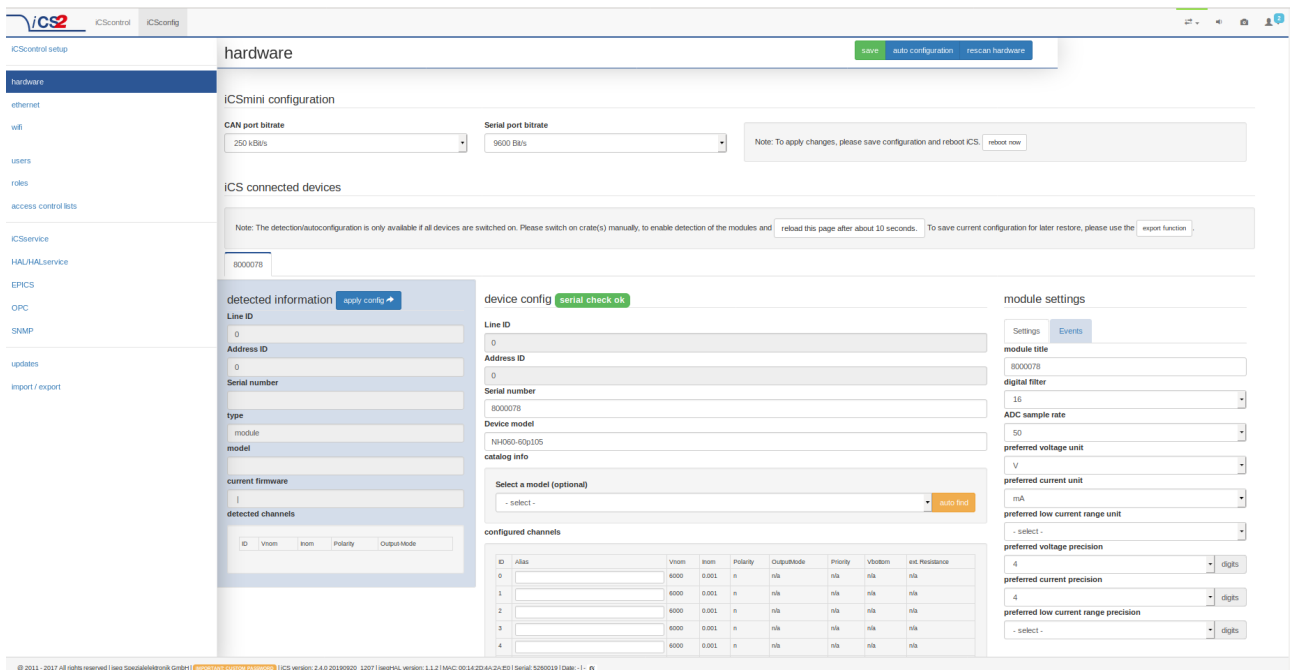


Before the SNMP server can be used, a namespace configuration file describing the hardware connected to CC24, iCSmini or SHR needs to be created and the SNMP service have to be started!

INFORMATION

The namespace configuration can be performed with the iCSconfig web interface. Enter the IP-Address of the CC24 or iCSmini in a web browser, sign in with user name and password and then select the iCSconfig dialog.

1. Configure the connected modules and store this configuration in iCSconfig.xml
 - Select the dialog iCSconfig > hardware
 - Make sure that the crate back plane respectively the connected modules (via CAN, USB or RS232) are switched on.
 - Press the button *rescan hardware* and then *auto configuration* to generate a default configuration file
 - *Save* the configuration at the end.



The screenshot displays the 'hardware' configuration page in the ICSControl software. It is divided into several sections:

- ICSmini configuration:** Includes dropdown menus for 'CAN port bitrate' (set to 250 kBits) and 'Serial port bitrate' (set to 9600 Bps). A note states: 'Note: To apply changes, please save configuration and reboot ICS. reboot now'.
- ICS connected devices:** A note indicates that detection/autocconfiguration is only available if all devices are switched on. It includes a 'reboot this page after about 10 seconds.' button and an 'export function' button.
- detected information:** A table with columns for Line ID, Address ID, Serial number, type, model, current firmware, and detected channels. The detected channels table has columns for ID, Vnom, Inom, Polarity, Output mode, Priority, Vbottom, and ext. Resistance.
- device config:** A 'serial check ok' status is shown. It includes fields for Line ID, Address ID, Serial number, and Device model (NH060-60j105). There is a 'Select a model (optional)' dropdown and an 'auto find' button.
- configured channels:** A table with columns: ID, Alias, Vnom, Inom, Polarity, Output mode, Priority, Vbottom, ext. Resistance.
- module settings:** Includes tabs for 'Settings' and 'Events'. Fields include module title (8000078), digital filter (10), ADC sample rate (50), preferred voltage unit (V), preferred current unit (mA), preferred low current range unit (mA), preferred voltage precision (4 digits), preferred current precision (4 digits), and preferred low current range precision (4 digits).

Figure 1: Configure the connected modules

2. Configure the SNMP namespace

- The *generate configuration* button generates the SNMP data points for all the connected modules.
- Download the .sub file in order to compare the configuration result.
- Switch on *autostart SNMP interface* and save the configuration.
- Press *Start SNMP* to start the SNMP server immediately.

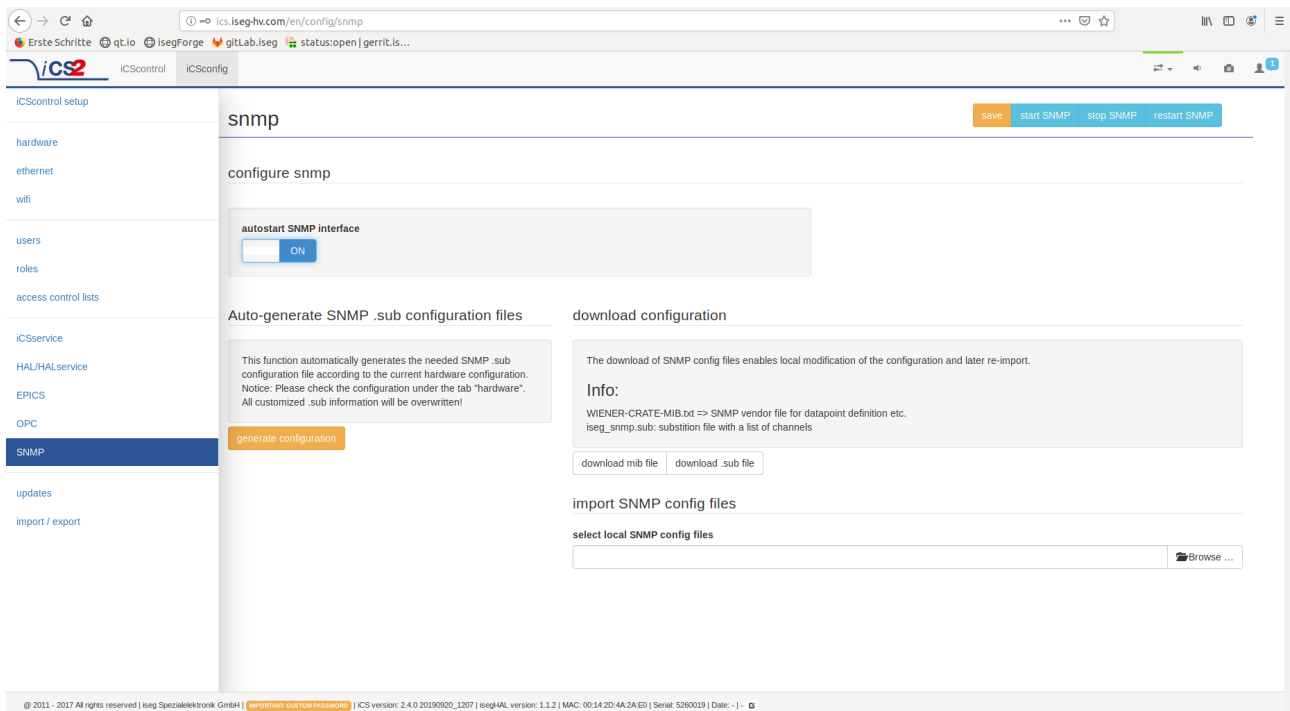


Figure 2: SNMP configuration dialog

4 Net-SNMP

Net-SNMP is a collection of open source SNMP programs and libraries, which can be used to access the CC24, iCSmini or SHR via the Simple Network Management Protocol. Please see <http://net-snmp.sourceforge.net/> for more details.

In order to perform SNMP calls to any iseq or WIENER product, the current WIENER-CRATE-MIB file must be stored on the PC doing the calls. Some more standard SNMP MIB files must be stored at that location too (at least SNMPv2-CONF.txt, SNMPv2-MIB.txt, SNMPv2-SMI.txt, SNMPv2-TC.txt, and SNMPv2-TM.txt)

By default that location is:


- On Linux: /usr/share/snmp/mibs
- On Windows: C:\usr\share\snmp\mibs

A copy of WIENER-CRATE-MIB file is ready for download from iCS-2. Use the button “download mib file”.

Beside providing a C library to do SNMP call, net-snmp also has ready-made command line programs to perform SNMP communication. The most commonly used programs are:

- **snmpwalk** – returns a group of parameters / items
- **snmpget** – returns a specific parameter (read)
- **snmpset** – sets a specific parameter (write)

INFORMATION



Please see the net-snmp description and help files for detailed instructions and options.

INFORMATION

All parameters defined for the iCS-2 system as well as crates, iCSmini or SHR are contained within the WIENER-CRATE-MIB.txt file (see description in there!).

The following community groups are used:

- "public": for all read operations
- "guru": to change parameters

A fast and easy way to begin using SNMP is to use command line arguments. The command line arguments specified in this document are based on netSNMP. The command line syntax is the same for both windows, Linux and probably MAC OSX.

For all WIENER-CRATE-MIB items, a quick help text can be shown by using:

```
snmptranslate -On -Td WIENER-CRATE-MIB::xxxx
```

```
snmptranslate -On -Td WIENER-CRATE-MIB::outputName
```

```
.1.3.6.1.4.1.19947.1.3.2.1.2
```

```
outputName OBJECT-TYPE
```

```
-- FROM WIENER-CRATE-MIB
```

```
-- TEXTUAL CONVENTION DisplayString
```

```
SYNTAX OCTET STRING (1..4)
```

```
DISPLAY-HINT "255a"
```

```
MAX-ACCESS read-only
```

```
STATUS current
```

```
DESCRIPTION "A textual string containing a short name of the  
output. If the crate is equipped with an alphanumeric  
display, this string is shown to identify a output channel.  
"
```

```
::= { iso(1) org(3) dod(6) internet(1) private(4) enterprises(1) wiener(19947)  
crate(1) output(3) outputTable(2) outputEntry(1) 2 }
```

A first communication with the CC24 crate can be done using the snmpwalk to confirm the existence of the power supply at the given IP address.

```
snmpwalk -Cp -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c public $ip
```

with:

snmpwalk:	This command will retrieve a block of information.
-v 2c:	This parameter specifies which version of the SNMP to use. WIENER devices use SNMP 2C.
-M \$path:	This parameter should be replaced with the path to the WIENER-CRATE-MIB.txt file. It is not needed in case the default path is used.
-m +WIENER-CRATE-MIB:	This parameter tells the command to look at the WIENER-CRATE-MIB to resolve the OID name.
-c public:	This specifies which community of values can be accessed.
\$ip:	This should be replaced with the IP address of the CC24 crate.

Example for crate with IP address 192.168.16.80:

```
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.80
```

returns:

```
SNMPv2-MIB::sysDescr.0 = STRING: iseg iCS (5230200, isegHAL 1.0.2.8)
SNMPv2-MIB::sysObjectID.0 = OID: WIENER-CRATE-MIB::sysMainSwitch.0
DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (91278) 0:15:12.78
SNMPv2-MIB::sysContact.0 = STRING: \"iseg Spezialelektronik GmbH (support@iseg-hv.de)
and WIENER\"
SNMPv2-MIB::sysName.0 = STRING: iseg-iCS2-5230200
SNMPv2-MIB::sysLocation.0 = STRING: iCS in the lab
SNMPv2-MIB::sysServices.0 = INTEGER: 79
```

A list of all available parameters or sub-parameters as for instance channels can be obtained using the command snmpwalk with the parameter "crate". To get all parameters use:

```
snmpwalk -Cp -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c public $ip crate
```

Example:

```
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.80 crate
```

Further it is possible obtain the array of names or values for a specific parameter. The following command provides a list of all existing output channels:

```
snmpwalk -Cp -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c public $ip outputName
```

Example:

```
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.80 outputName
```

returns for CC24 system with 2 ISEG EHS HV modules (8 channels each) in slot 1 and 2:

```
WIENER-CRATE-MIB::outputName.u100 = STRING: U100
WIENER-CRATE-MIB::outputName.u101 = STRING: U101
WIENER-CRATE-MIB::outputName.u102 = STRING: U102
WIENER-CRATE-MIB::outputName.u103 = STRING: U103
WIENER-CRATE-MIB::outputName.u104 = STRING: U104
WIENER-CRATE-MIB::outputName.u105 = STRING: U105
WIENER-CRATE-MIB::outputName.u106 = STRING: U106
WIENER-CRATE-MIB::outputName.u107 = STRING: U107
WIENER-CRATE-MIB::outputName.u200 = STRING: U200
WIENER-CRATE-MIB::outputName.u201 = STRING: U201
WIENER-CRATE-MIB::outputName.u202 = STRING: U202
WIENER-CRATE-MIB::outputName.u203 = STRING: U203
WIENER-CRATE-MIB::outputName.u204 = STRING: U204
WIENER-CRATE-MIB::outputName.u205 = STRING: U205
WIENER-CRATE-MIB::outputName.u206 = STRING: U206
WIENER-CRATE-MIB::outputName.u207 = STRING: U207
```

This example returns 16 index numbers. Please note the following geographic module and channel number coding for the SNMP call indexes, where the first digit is defined by the slot number and the following two by the channel of the particular module in this slot:

Slot	Channel	Name	Index
0	0 to 99	Uxx	.u00 to .u99
1	0 to 99	U1xx	.u100 to .u199
...
9	0 to 99	U9xx	.u900 to .u999

Please note that both the index as well as the name can be used!

```
snmpget -v 2c -m +WIENER-CRATE-MIB -c public 192.168.0.80 outputVoltage.u0
WIENER-CRATE-MIB::outputVoltage.u0 = Opaque: Float: 123.000000 V
```

is identical to

```
snmpget -v 2c -m +WIENER-CRATE-MIB -c public 192.168.0.80 outputVoltage.1
WIENER-CRATE-MIB::outputVoltage.u0 = Opaque: Float: 123.000000 V
```

In case of master slave crate system there will be an additional digit for the crate number:

Name = 1000 • crate + 100 • slot + channel

index = 1000 • crate + 100 • slot + channel

(crate: 1 ... 4 and 8 ... 11, slot: 0 ... 9, channel: 0 ... 99)

To see all Output channel set voltage values use snmpwalk with outputVoltage:

```
snmpwalk -Cp -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c public $ip outputVoltage
```

Example:

```
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.80 outputVoltage
```

returns for a CC24 system with one 8 channel ISEG EHS HV module in slot 2:

```
WIENER-CRATE-MIB::outputVoltage.u200 = Opaque: Float: 100.000000 V
WIENER-CRATE-MIB::outputVoltage.u201 = Opaque: Float: 200.000000 V
WIENER-CRATE-MIB::outputVoltage.u202 = Opaque: Float: 300.000000 V
WIENER-CRATE-MIB::outputVoltage.u203 = Opaque: Float: 400.000000 V
WIENER-CRATE-MIB::outputVoltage.u204 = Opaque: Float: 500.000000 V
WIENER-CRATE-MIB::outputVoltage.u205 = Opaque: Float: 600.000000 V
WIENER-CRATE-MIB::outputVoltage.u206 = Opaque: Float: 700.000000 V
WIENER-CRATE-MIB::outputVoltage.u207 = Opaque: Float: 800.000000 V
```

After obtaining information about the power supplies or a list of channels and parameters, it is useful to be able to write or read information about it. This can be done using the **snmpget** and **snmpset** commands.

```
snmpget -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip name.index
```

```
snmpset -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip name.index format value
```

The most common kind of call you will want is to get data from the power supply. This is easily done via the **snmpget** command. The example below retrieves information about whether the main power for the crate is on. If you wish to test this example on your own system replace “\$path” with the path to WIENER-CRATE-MIB.txt (/usr/share/snmp/mibs by default and “\$ip” with the ip address of your CC24 (see following examples).

```
snmpget -v 2c -M $path -m +WIENER-CRATE-MIB -c public $ip sysMainSwitch.0
```

```
WIENER-CRATE-MIB::sysMainSwitch.0 = INTEGER: OFF(0)
```

This indicates that the CC24 crate is currently off. To better understand the call above we will break it down by parameter:

snmpget :	This command will retrieve a value about the CC24 crate or one of the channels it houses.
-v 2c :	This parameter specifies which version of the SNMP to use. WIENER devices use SNMP 2C.
-M \$path :	This parameter should be replaced with the path to the WIENER-CRATE-MIB.txt file.
-m +WIENER-CRATE-MIB :	This parameter tells the command to look at the WIENER-CRATE-MIB to resolve the OID name.
-c public :	This specifies which community of values can be accessed.
\$ip :	This should be replaced with the IP address of the CC24 crate.
sysMainSwitch.0 :	This is the register you wish to retrieve.

Since we know from the call above that the crate is off, we may want to turn it on. To turn CC24 on, we can use the command:

```
snmpset -v 2c - path -m +WIENER-CRATE-MIB -c guru $ip sysMainSwitch.0 i 1
```

Most of the parameters for **snmpset** are the same as **snmpget**, the new parameters are highlighted below:

- **i:** Since sysMainSwitch.0 is an integer value, we specify the value to be an integer with.
- **1:** This is the value we wish to write. In this case we write ‘one’ to set the main switch to on.

For most of the write commands (snmpset) the access type has to be changed from public to guru. A complete list of value names that can be written or read via SNMP can be found in the WIENER-CRATE-MIB but commonly needed values are:

Value Name	Type	Access	Comments
outputVoltage	Float	R/W	Channel voltage set
outputCurrent	Float	R/W	Channel current set
outputMeasurementSenseVoltage	Float	R	Actual channel voltage at sense line
outputMeasurementTerminalVoltage	Float	R	Actual channel voltage at terminal
outputMeasurementCurrent	Float	R	Actual channel current
outputConfigMaxSenseVoltage	Float	R	Nominal voltage for sense line
outputConfigMaxTerminalVoltage	Float	R	Nominal voltage for terminal
outputConfigMaxCurrent	Float	R	Nominal current
outputSwitch	Integer	R/W	Turns channel ON / OFF, Emergency off, reset error flags
outputVoltageRiseRate	Float	R/W	Channel voltage rampe rate up
outputVoltageFallRate	Float	R/W	Channel voltage rampe rate down
outputCurrentRiseRate	Float	R/W	Channel current rampe rate up
outputCurrentFallRate	Float	R/W	Channel current rampe rate down
outputStatus	Bits	R	Channel status information

For example, to read channel set voltage use:

```
snmpget -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputVoltage.index
```

Example:

```
snmpget -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputVoltage.u0
WIENER-CRATE-MIB::outputVoltage.u0 = Opaque: Float: 0.000000 V
```

Write and read individual set voltages, "guru" access needed to write!

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputVoltage.u101 F 200
WIENER-CRATE-MIB::outputVoltage.u101 = Opaque: Float: 200.000000 V
```

Note the "F" before the 200, this indicates that the value is a floating point number. This value can be read back via:

```
snmpget -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputVoltage.u101
WIENER-CRATE-MIB::outputVoltage.u101 = Opaque: Float: 200.000000 V
```

Turning Channels ON/OFF - The individual channels of an CC24 system low or high voltage module can be turned on or off using the snmpset command. To turn on channel Ux:

```
snmpset -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputSwitch.index i 1
```

The same channel can be turned off with:

```
snmpset -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputSwitch.u101 i 0
```

The outputSwitch can also be used for emergency-off and to reset error flags. The matching values are:

```
{off(0), on(1), resetEmergencyOff(2), setEmergencyOff(3), clearEvents(10)}
```

Item	Type	Access	Switch functions
OutputSwitch	Integer	W	Off (0) On (1) resetEmergencyOff (2) setEmergencyOff (3) clearEvents (10)

Example:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputSwitch.u101 i 1
```

CC24 low and high voltage modules have programmable voltage ramp speeds. The WIENER low voltage modules allow different ramp up and down values for each channel whereas for most of ISEG modules with common ramp the channel ramp up and down changes the ramp speed for any channel of the module! For write access "guru" is needed:

```
snmpset -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru  
$ipoutputVoltageRiseRate.index F value
```

Example:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputVoltageRiseRate.u101 F  
10
```

```
WIENER-CRATE-MIB::outputVoltageRiseRate.u101 = Opaque: Float: 10.000000 V/s
```

```
snmpget -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputVoltageRiseRate.u101  
WIENER-CRATE-MIB::outputVoltageRiseRate.u101 = Opaque: Float: 10.000000 V/s
```

To access multiple units the groupsSwitch function provides access to all modules in the CC24 crate (index 0), all ISEG HV modules (index 64), or to all WIENER low voltage modules (index 128). In addition groups can be defined for low voltage modules.

Item	Type	Access	Switch functions
groupsSwitch	Integer	W	Off (0) On (1) resetEmergencyOff (2) setEmergencyOff (3) disableKill (4), enableKill (5), clearEvents (10)

Example switch all channels of all modules on:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 groupsSwitch.0 i 1
WIENER-CRATE-MIB::groupsSwitch.0 = INTEGER: on(1)
```

Example switch all channels off:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 groupsSwitch.0 i 0
WIENER-CRATE-MIB::groupsSwitch.0 = INTEGER: off(0)
```

Example switch all high voltage channels (ISEG modules) off:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 groupsSwitch.64 i 0
WIENER-CRATE-MIB::groupsSwitch.64 = INTEGER: off(0)
```

Example RESET ISEG HV Modules after Safetyloop error:

```
snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 groupsSwitch.64 i 10
WIENER-CRATE-MIB::groupsSwitch.64 = INTEGER: clearEvents(10)
```

Item	Type	Access	Switch functions
outputSupervisionBehavior	Integer	R/W	0 ignore the failure 1 switch off this channel 2 switch off all channels with the same group number 3 switch off the complete crate.

A bit field packed into an integer which define the behaviour of the output channel / power supply after failures. For each supervision value, a two-bit field exists. The enumeration of this value (..L+..H • 2) is:

- Bit 0, 1: outputFailureMinSenseVoltage
- Bit 2, 3: outputFailureMaxSenseVoltage
- Bit 4, 5: outputFailureMaxTerminalVoltage
- Bit 6, 7: outputFailureMaxCurrent
- Bit 8, 9: outputFailureMaxTemperature
- Bit 10,11: outputFailureMaxPower
- Bit 12, 13: outputFailureInhibit
- Bit 14, 15: outputFailureTimeout

5 iseg High Voltage Module special commands

Item	Type	Access	Unit	Range
outputVoltageRiseRate	Float	R/W	V/s	1 mV/s - 20% * VoltageNominal 1% * VoltageNominal (KILL enabled)

Note that most of HV modules have one common value for ramping up and down for all channels. This value can be set or read by using any channel number of the particular module as index. EHS, EDS and EBS modules typically have a ramp rate range from 1mV/s... 20% of VoltageNominal (max. nominal voltage). In case KILL is enabled the maximum ramp rate is reduced to 1% of VoltageNominal in order to lower the risk of unwanted trips during voltage ramp cycles.

```
snmpset -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip
outputVoltageRiseRate.index          F value
```

Item	Type	Access	Unit	Range
outputCurrentRiseRate	Float	R/W	A/s	(2% - 100%) * CurrentNominal

Note that most of HV modules accesses for the outputCurrentRiseRate and outputCurrentFallRate one common data point and therefore will be reply always the same value.

The HV modules which implements the latest software kernel supports different rise and fall rates for current and voltage per channel.

Item	Type	Access	Unit	Range
outputTripTimeMaxCurrent	Float	R/W	ms	8 - 4000 ms

Description: The outputTripTimeMaxCurrent defines a span for the time out function. The activity is depending from the programmed bit field outputFailureMaxCurrent of the item outputSupervisionBehavior. A write value of 0 is switching off the delayed trip function which was defined in the bit field outputFailureMaxCurrent of outputSupervisionBehavior before.

Item	Type	Access	Status bits
outputStatus	Bits	W	outputEnableKill(13) outputEmergency(14) outputVoltageBottomReached(21)

Read: An enumerated value which shows the current state of the output channel.

Item	Type	Access	Status bits
outputSwitch	Bits	R/W	Off(0) On(1) resetEmergencyOff(2) setEmergencyOff(3) clearEvents(10)

Read to request the state of channel switches.

Write to switch the state of the channel:

- If the channel is On, and the write value is Off, then the channel will switch off by ramping down the High Voltage.
- If the channel is Off, and the write value is On, and if no other signals (mainInhibit, outputInhibit, outputEmergencyOff or outputFailureMaxCurrent) are active, then the channel will switch on by ramping up High Voltage.
- If the write value is resetEmergencyOff, then the channel will leave the state EmergencyOff. A write of clearEvents is necessary before the voltage can ramp up again.
- If the write value is setEmergencyOff, then the channel will enter to the state EmergencyOff, which means that the High Voltage will switch off without a ramp and reset of the outputVoltage to null volt. Switching on of High Voltage is not possible in state EmergencyOff.
- If the write value is clearEvents, then all failure messages of the outputStatus will be reset (all channel events, all module events and the state EmergencyOff).

Item	Type	Access	Switch functions
groupsSwitch.64	Integer	W	Off(0) On(1) resetEmergencyOff (2) setEmergencyOff (3) disableKill (4), enableKill (5), disableAdjust(6), enableAdjust(7), clearEvents(10)

Write to switch the state of all channels of group 64 (all high voltage modules):

- If any channel is On, and the write value is Off, then all channels will switch off by ramping down the High Voltages.
- If any channel is Off, and the write value is On, and if no other signals (mainInhibit, outputInhibit, outputEmergencyOff or outputFailureMaxCurrent) are active, then all channels will switch on by ramping up High Voltages.
- If the write value is resetEmergencyOff, then all channels will leave the state EmergencyOff. A write of clearEvents is necessary before the voltage can ramp up again.
- If the write value is setEmergencyOff, then all channels will enter to the state EmergencyOff, which means that the High Voltage will switch off without a ramp and reset of the outputVoltage to null volt. Switching on of High Voltage is not possible in state EmergencyOff.
- If the write value is disableKill, then all channels will switch to disableKill.
- If the write value is enableKill, then all channels will switch to enableKill.
- If the write value is disableAdjust, then all channels will switch off the function for High Voltage fine adjustment.
- If the write value is enableAdjust, then all channels will switch on the function for High Voltage fine adjustment.
- If the write value is clearEvents, then all failure messages of the outputStatus will be reset (all channel events, all module events and the state EmergencyOff).

Item	Type	Access	Switch functions
outputSupervisionBehavior	Integer	R/W	0 ignore the failure 1 switch off this channel by ramp down the voltage 2 switch off this channel by set a internal EmergencyOff 3 switch off the whole board of the HV module by set EmergencyOff.

A bit field packed into an integer which define the behaviour of the output channel / power supply after failures. For each supervision value, a two-bit field exists. The enumeration of this value (..L+..H*2) is:

The iseg HV devices can use the bit fields:

Bit 6, 7: outputFailureMaxCurrent

Bit 12, 13: outputFailureInhibit

outputFailureMaxCurrent support of the function delayed trip

The programmed activity will start when the actual current exceeded permanently the item outputCurrent over the span of the programmed time out (set via the item outputTripTimeMaxCurrent).

outputFailureInhibit support of the optional hardware function EXTERNAL INHIBIT per channel

The programmed activity will start when an external channel inhibit occurs

The channel state have to be in disableKill for a proper work of the configuration of the behaviour for the functions above.

6 iseg Load Module commands

Item	Type	Access	Unit
outputMeasurementTerminalVoltage	Float	R	V
outputMeasurementCurrent	Float	R	A

DESCRIPTION

The items outputMeasurementTerminalVoltage and outputMeasurementCurrent return the voltage and current measured internally by the load unit. These values are only measured if the external measurement and ripple measurement are turned off.

Item	Type	Access	Status bits
outputSwitch	Bits	R/W	ClearEvents (10) setExternalAndRippleMeasurementOff(20) setExternalMeasurementOn(21) setRippleMeasurementOn(22) setExternalAndRippleMeasurementOn(23)

DESCRIPTION

The item outputSwitch allows to activate or deactivate external measurements for a channel via the measurement outputs on the front panel of the load unit:

- The value setExternalAndRippleMeasurementOff deactivates all measurement outputs for the channel.
- The value setExternalMeasurementOn activates the voltage and current measurement outputs of the channel.
- The value setRippleMeasurementOn activates the ripple measurement output of the channel.
- The value setExternalAndRippleMeasurementOn activates all three measurement outputs of the channel.

Note the measurement output can only be activated for one channel at the same time, i.e. if an output is activated for another channel the previously switched channel is deactivated.

If an external measurement output is activated no internal measurement will be executed. In order to reactivate the internal measurement, the external measurement must be completely deactivated. (If the current output status is unknown this can be done by writing setExternalAndRippleMeasurementOn and then setExternalAndRippleMeasurementOff for an arbitrary channel.)

All other SNMP items from the branch outputTable are readable for the SNMP compatibility but will not be used by the load unit.

7 ISEG Module commands

```
snmptranslate -On -Td WIENER-CRATE-MIB::moduleIndex
.1.3.6.1.4.1.19947.1.3.6.1.1
moduleIndex OBJECT-TYPE
-- FROM WIENER-CRATE-MIB
SYNTAX INTEGER {ma0(1), ma1(2), ma2(3), ma3(4), ma4(5), ma5(6), ma6(7), ma7(8),
ma8(9), ma9(10)}
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION      "A unique number for each HV/LV module. Its value
ranges between 1 and the total number of HV/LV modules.
Note, index 1 corresponds to ma0."
 ::= { iso(1) org(3) dod(6) internet(1) private(4) enterprises(1) wiener(19947)
crate(1) output(3) moduleTable(6) moduleEntry(1) 1 }
```

All iseg High Voltage modules configure some common data points as snmp items under the moduleTable entry point.

```
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.178.63 moduleTable
WIENER-CRATE-MIB::moduleIndex.ma0 = INTEGER: ma0(1)
WIENER-CRATE-MIB::moduleDescription.ma0 = STRING: "iseq, E08F7, 8, 8150004, 02.27"
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementVoltage0.ma0 = Opaque: Float: 24.148500 V
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementVoltage1.ma0 = Opaque: Float: 5.015030 V
WIENER-CRATE-MIB::moduleHardwareLimitVoltage.ma0 = Opaque: Float: 101.991997 %
WIENER-CRATE-MIB::moduleHardwareLimitCurrent.ma0 = Opaque: Float: 102.010002 %
WIENER-CRATE-MIB::moduleRampSpeedVoltage.ma0 = Opaque: Float: 20.000000 %
WIENER-CRATE-MIB::moduleRampSpeedCurrent.ma0 = Opaque: Float: 50.000000 %
WIENER-CRATE-MIB::moduleStatus.ma0 = BITS: 00 EE 00 00 moduleIsNoSumError(8)
moduleIsNoRamp(9) moduleSafetyLoopIsGood(10) moduleIsGood(12) moduleSupplyIsGood(13)
moduleTemperatureIsGood(14)
WIENER-CRATE-MIB::moduleEventStatus.ma0 = BITS: 00 00 00 00
WIENER-CRATE-MIB::moduleEventChannelStatus.ma0 = BITS: 00 00 00 00
WIENER-CRATE-MIB::moduleDoClear.ma0 = INTEGER: nothing(0)
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementTemperature0.ma0 = Opaque: Float:
27.087400 degr.C
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementTemperature1.ma0 = Opaque: Float:
27.087400 degr.C
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementTemperature2.ma0 = Opaque: Float:
27.087400 degr.C
WIENER-CRATE-MIB::moduleAuxiliaryMeasurementTemperature3.ma0 = Opaque: Float:
27.087400 degr.C
```

Item	Type	Access	Comment
moduleDescription	Octet string	R	Company name, firmware name, channel number, serial number
moduleAuxiliaryMeasurementVoltage0	Float	R	Returns the measurement value of the line supply 24 Volt.
moduleAuxiliaryMeasurementVoltage1	Float	R	Returns the measurement value of the line supply 5 Volt.
moduleHardwareLimitVoltage	Float	R	Returns the Vmax value of the front panel in percent
moduleHardwareLimitVoltage	Float	R	Returns the Imax value of the front panel in percent
moduleRampSpeedVoltage	Float	R/W	Module voltage ramp speed of all channels in percent of outputConfigMaxTerminalVoltage
moduleRampSpeedCurrent	Float	R/W	Module current ramp speed of all channels in percent of outputConfigMaxCurrent
moduleStatus	Bits	R	ModuleIsKillEnable (15) ModuleTemperatureIsGood(14) moduleSupplyIsGood(13) moduleIsGood(12) moduleIsEventActive (11) moduleSafetyLoopsGood(10) moduleIsNoRamp(9) moduleIsNoSumError(8) moduleIsInputError (6) moduleHardwareLimitVoltageIsGood (5) moduleNeedService (4) moduleIsHighVoltageOn (3) moduleIsLiveInsertion (2) moduleIsFineAdjustment (0)
moduleEventStatus	Bits	R/W	ModuleEventTemperatureNotGood (14) moduleEventSupplyNotGood (13) moduleEventSafetyLoopNotGood (10) moduleEventInputError (6) moduleHardwareLimitVoltageNotGood (5) moduleEventService (4) moduleEventLiveInsertion (2) moduleEventPowerFail (0)
moduleEventChannelStatus	Bits	R	Bit field that reserves one bit for every channel.
moduleDoClear	Integer	R/W	All events of the module will be cleared.
moduleAuxiliaryMeasurementTemperature0	Float	R	The measured module temperature of sensor 1.
moduleAuxiliaryMeasurementTemperature1	Float	R	The measured module temperature of sensor 2.
moduleAuxiliaryMeasurementTemperature2	Float	R	The measured module temperature of sensor 3.
moduleAuxiliaryMeasurementTemperature3	Float	R	The measured module temperature of sensor 4.

8 WIENER MPV Module commands

Item	Type	Access
outputUserConfig	Integer32 (0..127)	R/W

DESCRIPTION: "Definition of user-changeable items.

A bit field packed into an integer which define the behavior of the output channel.

Usable for WIENER LV devices only.

The position of the bit fields in the integer value are:

- Bit 0: Voltage ramping at switch off:
 - 0: Ramp down at switch off.
 - 1: No ramp at switch off (immediate off)
- Bit 1, 2: Set different regulation modes, dependent on the cable inductance:
 - 0: fast: short cables, up to 1 meter.
 - 1: moderate: cables from 1 to 30 meter.
 - 2: fast: identical to 0 (should not be used)
 - 3: slow: cables longer than 30 meter.
- Bit 3: Internal sense line connection to the output (MPOD only):
 - 0: The sense input at the sense connector is used for regulation.
 - 1: The output voltage is used for regulation. Any signals at the sense connector are ignored.
- Bit 4: Enable External Inhibit input.
 - 0: The external inhibit input is ignored.
 - 1: The external inhibit input must be connected to a voltage source to allow switch on.
- Bit 5: Disable Global Inhibit inputs.
 - 0: The global inhibit/interlock inputs of the system is active.
 - 1: The global inhibit/interlock inputs of the system is ignored.
- Bit 6: Automatic Power On.
 - 0: After switching the main system switch ON, the output is not switched on automatically. A separate outputSwitch command is required.
 - 1: After switching the main system switch ON, the output is switched on automatically. If 'Disable Global Inhibit' (bit 5) is set, the output will be switched on regardless of the global inhibit/interlock signals.

9 Appendix

For more information please use the following download links:

This document
http://download.iseg-hv.com/SYSTEMS/MMS/EBS/iseg_datasheet_EBS_en.pdf
CAN EDCP Programmers-Guide
http://download.iseg-hv.com/SYSTEMS/MMS/CAN_EDCP_Programmers-Guide.pdf
iseg Hardware Abstraction Layer
http://download.iseg-hv.com/SYSTEMS/MMS/isegHardwareAbstractionLayer.pdf
Net-SNMP project page
http://net-snmp.sourceforge.net

10 Manufacturer's contact

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