MPOD LV / HV System Startup Information

1) Configuration:
   Mpod Mini crate with MpodC Controller

   4 slots for ISEG HV EHQ/EHS/EDS or WIENER LV Modules
   Interfaces:

   USB: for MUSE Software (MPOD Controller and configuration)

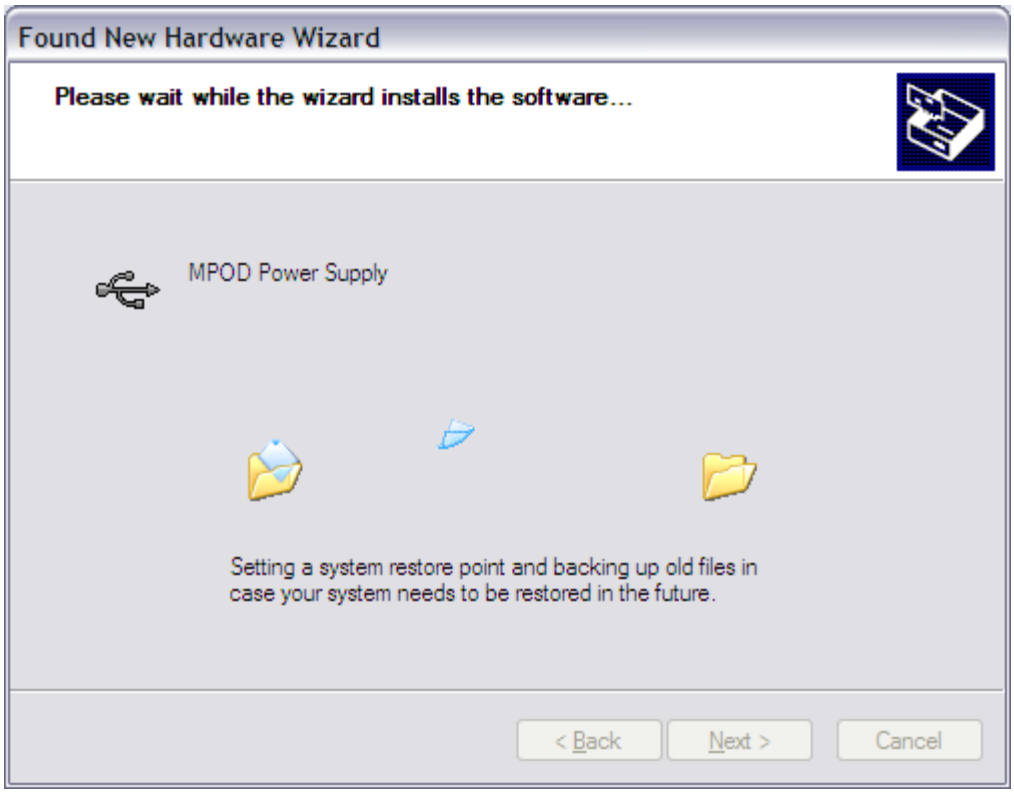
   Ethernet: Web monitor, SNMP

   CAN-bus: ISEG Can bus software

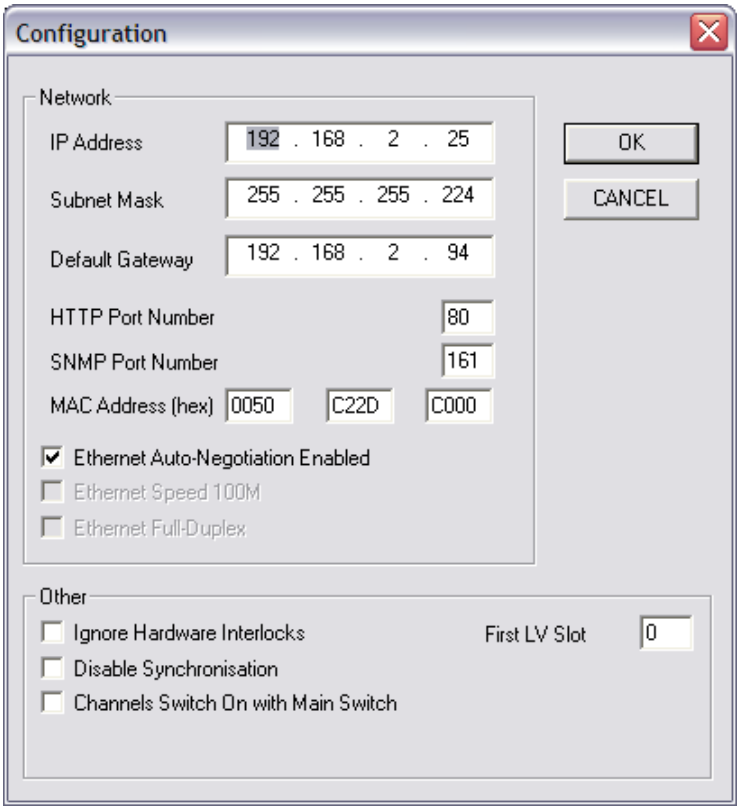
   Ethernet: IP address 192.168.2.25 (can be changed with MUSEControl)

2) Please install the LV / HV Modules in the slots close to the controller. Channel numbers of low and high voltage modules are geographically coded with 3 digits xyy with x=slot (starting at 0) and yy channel number in module.

3) Software Installation:
Run the MUSEControl.msi Program to install all drivers and the USB program MUSEControl. Connecting the MPOD Controller via USB it should be automatically detected and the Silicon Labs USB drivers (SiLib.sys and SiUSBXp.sys) loaded



4) Configuration Setup
Please connect the MPOD Controller via USB and run the MUSEControl program. An error message “No module found” can pop up in case no low voltage modules are in the crate. Ignore this message and select System -> Configuration.



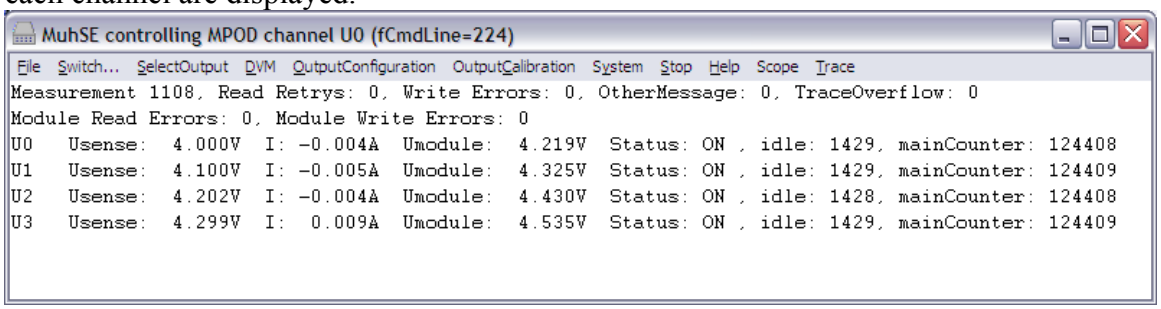
In the *Network* group box enter the TCP/IP network settings (IP address, subnet mask and default gateway). You have to use the parameters of your local network. Please contact your network administrator for details.

HTTP and SNMP port numbers should only be modified if you know what you doing. Setting any port to 0 disables the server.

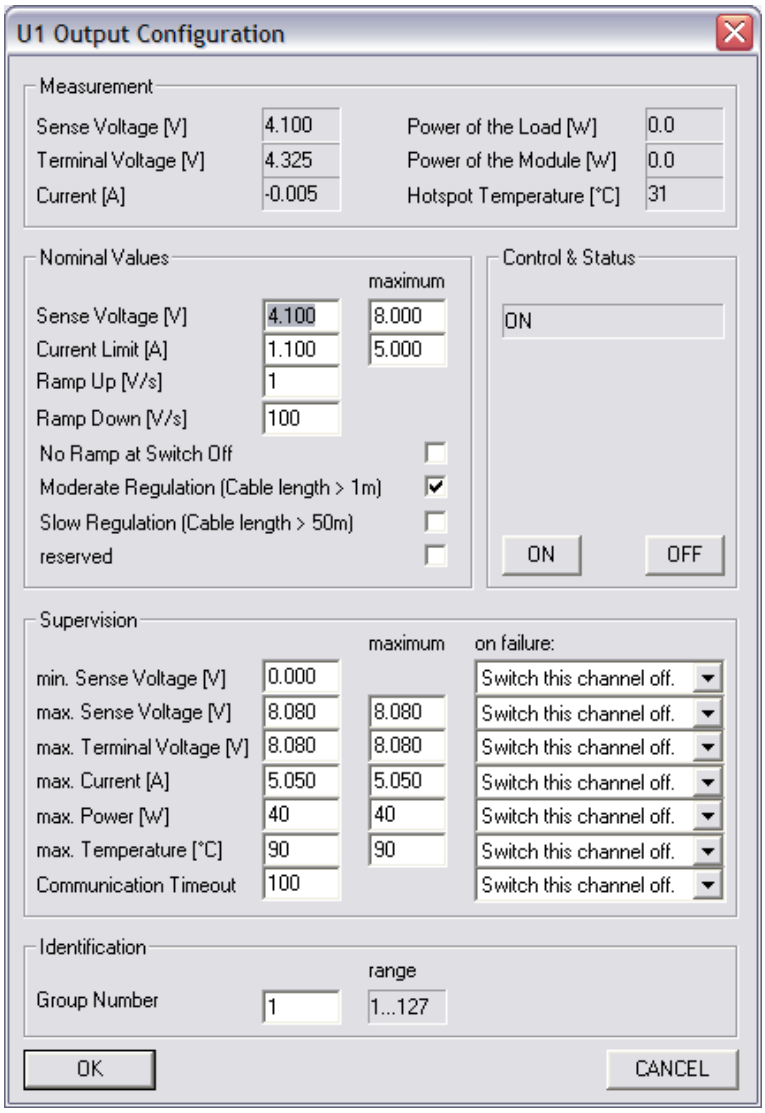
If the "Channels Switch On with Main Switch" check box in the *Other* group box is checked, all output channels are switched on if the main switch is switched on.

In case low voltage modules are plugged in to the crate type in the first LV slot. For HV only configurations select a number outside the crate (5 for Mini crates)

5) The Low Voltage module can be monitored and programmed with the MUSEControl program via the USB interface. The measured sense voltage (Usense), current (Imodule) and terminal voltage (Umodule) and a global status of each channel are displayed.



Clicking with the left mouse button on a channel will switch it on / off. The right mouse button opens the Channel Detail Window:



This dialog allows the detailed configuration of each power supply channel. The *Measurement* group shows the measured sense voltage, terminal voltage and current.

The sense voltage is the voltage at the sense lines, which are connected to the load. Terminal voltage means the voltage at the terminals of the module. Depending on the used modules, an analog or digital value of the most critical point of the power module is displayed. The power of the load and the output power of the module are calculated values.

In the *Nominal Values* group the nominal values of the output voltage, the maximum

current which the power supply will source before it switches into constant current

mode, and the voltage rise and fall rates are entered.

If the *No Ramp at Switch Off* check box is checked, the *Ramp Down* value is only

used if the nominal voltage is changed. If the voltage is set to 0, the channel ramps down to zero and than switches off. But using the *OFF* button to switch off cuts off the output voltage immediately.

The voltage regulation parameters can be modified with the *Moderate Regulation* check box. If unchecked, the standard (PI) regulator is used. This is the fastest regulation, but may start oscillating with wires to the load longer than 1 meter. In this situations the advanced (PID) regulator of the *Moderate Regulation* should be used.

If the load is connected with really long or high-inductance cable, the *Slow Regulation* check box should be checked additionally. This increases the time constant of the I-Regulator.

The *Control and Status* group has buttons to switch the channel on or off. In case of any

errors they are displayed here, too.

The *Supervision* group contains all items which the microcontroller can observe. In case of exceeding a limit, a dedicated action can be assigned to each item. It is possible to

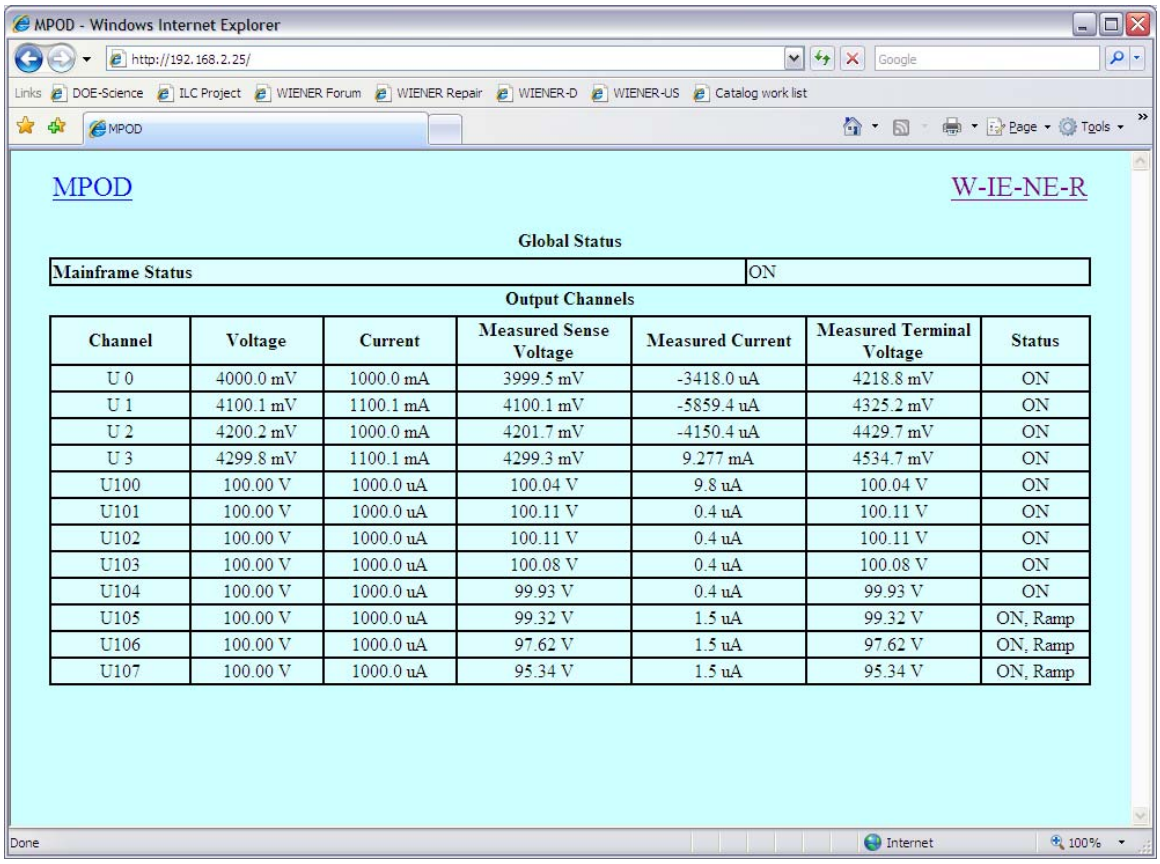
- ignore the failure (not possible at max. terminal voltage, max power and max. temperature: the power supply has to protect itself)
- switch this channel off
- switch all channels with the same group number off
- switch all channels of the power supply off

The Identification group contains just a single item, the group number of the channel.

Many SNMP network commands can address a single channel (identified by the channel

number) or a group (identified by the group number), so it is possible to access different channels with only one network message.

6) Monitoring of all Low and high voltage channels can be done with a web browser by providing the IP address as URL.
   Web Browser Monitoring:



Global Status

Mainframe Status	ON

Output Channels

Channel	Voltage	Current	Measured Sense Voltage	Measured Current	Measured Terminal Voltage	Status
U 0	4000.0 mV	1000.0 mA	3999.5 mV	-3418.0 uA	4218.8 mV	ON
U 1	4100.1 mV	1100.1 mA	4100.1 mV	-5859.4 uA	4325.2 mV	ON
U 2	4200.2 mV	1000.0 mA	4201.7 mV	-4150.4 uA	4429.7 mV	ON
U 3	4299.8 mV	1100.1 mA	4299.3 mV	9.277 mA	4534.7 mV	ON
U100	100.00 V	1000.0 uA	100.04 V	9.8 uA	100.04 V	ON
U101	100.00 V	1000.0 uA	100.11 V	0.4 uA	100.11 V	ON
U102	100.00 V	1000.0 uA	100.11 V	0.4 uA	100.11 V	ON
U103	100.00 V	1000.0 uA	100.08 V	0.4 uA	100.08 V	ON
U104	100.00 V	1000.0 uA	99.93 V	0.4 uA	99.93 V	ON
U105	100.00 V	1000.0 uA	99.32 V	1.5 uA	99.32 V	ON, Ramp
U106	100.00 V	1000.0 uA	97.62 V	1.5 uA	97.62 V	ON, Ramp
U107	100.00 V	1000.0 uA	95.34 V	1.5 uA	95.34 V	ON, Ramp

7) SNMP Installation (for C++ / LabView)

Please install NETSNMP from the CD-ROM on the control computer.

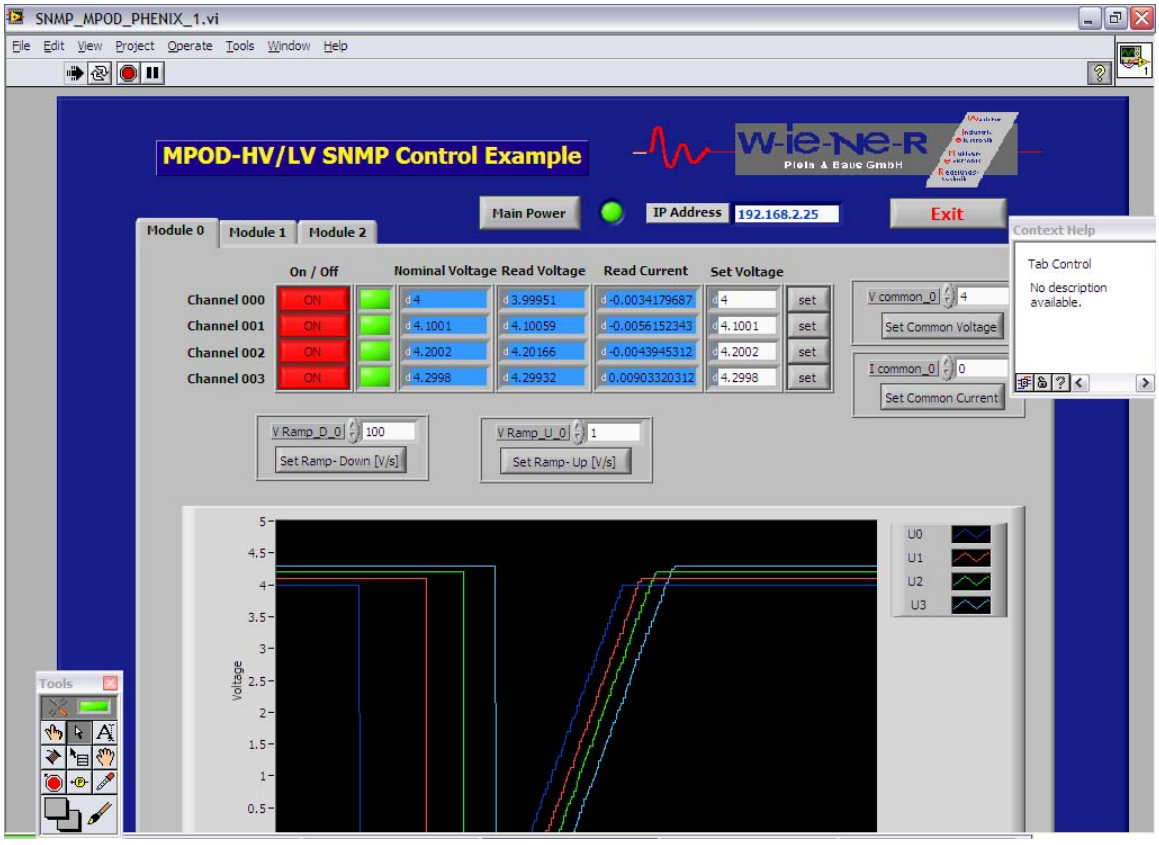
Copy the MIB file WIENER-CRATE-MIB.txt into the C:\usr\share\snmp\mibs.

8) LabView Control Program

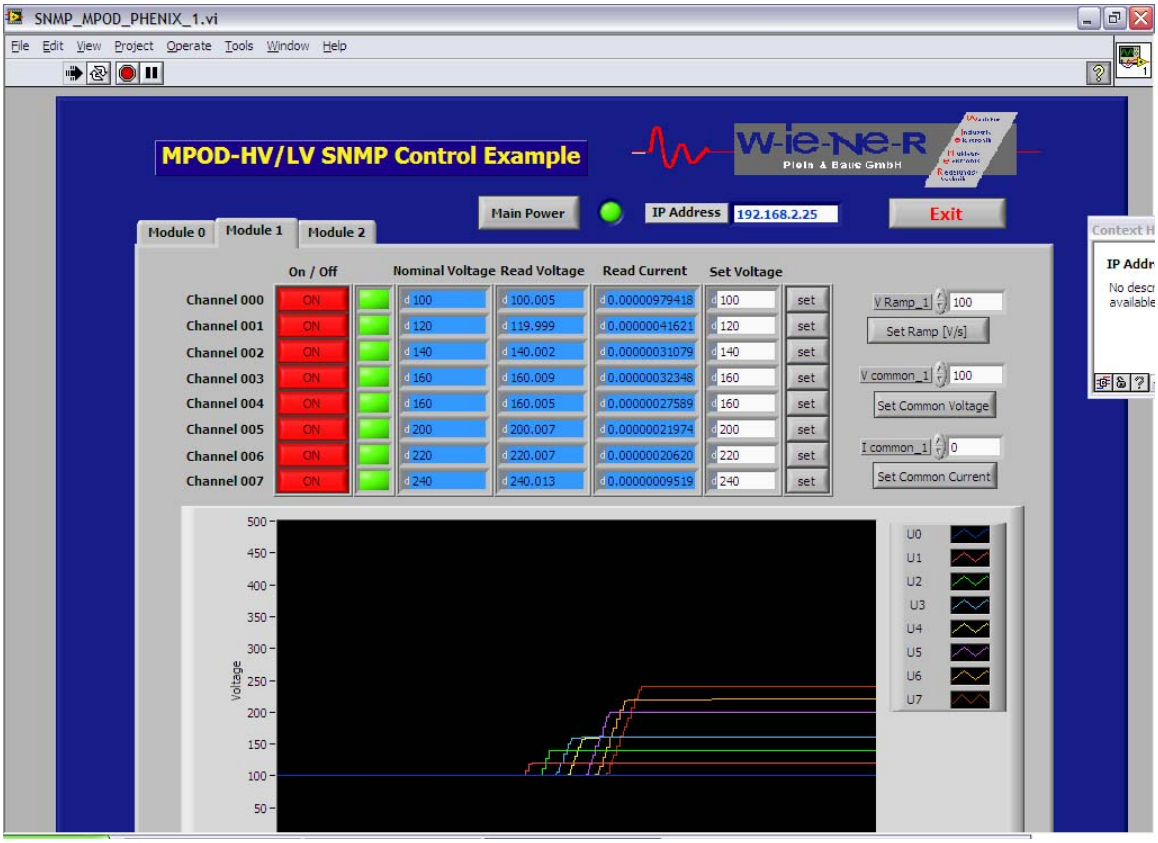
The LabView Control programs SNMP_MPOD_xxx.vi allow controlling both low and high voltage channels for the above configuration. The program can run in parallel to web monitoring. All LabView MPOD function VI's are using SNMP calls from the WIENER_SNMP_Basic.dll. This DLL requires NETSNMP and the WIENER –CRATE-MIB.txt file as described above!

Please run SNMP_MPOD_xxx.vi with either LabView 8.0 / 8.2 or 8.5.

A) Low Voltage Module window:



B) High voltage window (for 8 channels):



8) SNMP line commands / scripts

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

In order to perform SNMP calls from any WIENER product the WIENER-CRATE-MIB file must be stored somewhere on the PC doing the calls, by default that location should be /usr/share/snmp/mibs.

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 MPOD.

```
:/$ 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 MPOD 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 MPOD crate or one of the channels it houses..

-v 2c:

This parameters 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 MPOD crate.

sysMainSwitch.0:

This is the register you wish to retrieve.

Since we we know from the call above that the crate is off, we may want to turn it on. (Software power cycling is only possible of the green mains switch on the MPOD is "ON", this is to prevent a remote user to override a local user and adds a level of safety to the unit.) To turn MPOD on, we can use the command:

```
:/$ snmpset -v 2c - path -m +WIENER-CRATE-MIB -c public $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.

Getting a list of Channels

To a list of all available channels can be obtained using the command:

```
:/$ snmpwalk -Cp -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru  $ip outputName
U0
U1
….
U3
U100
U101
…..
U107
Variables found: 12
```

This example returns 12 index numbers. The first 4 channels, U0-U3, come from the LV module in slot 0. The second group of channels, U100-U107, comes from the module in slot 1. The naming rule for output channels is:

slot 0: Uxx

slot 1: U1xx

slot 2: U2xx

slot 3: U3xx

etc…

Get / Set Channel Values

After obtaining a list of channels, it is useful to be able to write or read information about that channel. This can be done using the snmpget and snmpset commands. For example, to write channel U0 set point to 200V:

:/$ snmpset -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputVoltage.U0 F 200 WIENER-CRATE-MIB::outputVoltage.U0 = 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 -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputVoltage.U0 200.000000 V

A complete list of values 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	The Channel set Voltage
outputCurrent	Float	R/W	The channel current limit
outputMeasurementSenseVoltage	Float	R	Actual channel Voltage
outputMeasurementCurrent	Float	R	Actual channel current
outputSwitch	Integer	R/W	Turns channel ON/OFF
outputVoltageRiseRate	Float	R/W	Channel ramp rate
outputStatus	Bits	R	Channel Status information

Turning Channels ON/OFF

The individual channels of an MPOD system can be turned on or off using simple snmpset commands. To turn on channel Ux:

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

The same channel can be turned off with:

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

A BASH Simple Script

All of the commands above could be combined into scripts to set and monitor a predefined set of channels. For example a Bash script to read all channels and set the voltages and current limit to the same value for each channel could look like:

```
#!/bin/bash
# Simple Bash Script that will read and set all channels in a MPOD crate

ip=192.168.2.25
path=/usr/share/snmp/mibs
setVoltage=5
setCurrent=.100
setStatus=1
setRamp=100

channelCount=$(snmpget -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputNumber.0)
indices=$(snmpwalk -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputIndex)
x=(`echo $indices | tr ' ' '\'')

COUNTER=0
```

```
while [  $COUNTER -lt $channelCount ]; do
   index=$(echo ${x[${COUNTER}]})

   voltage=$(snmpset  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputVoltage.$index
F $setVoltage)
   iLimit=$(snmpset  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputCurrent.$index F
$setCurrent)
   rampspeed=$(snmpset  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip
outputVoltageRiseRate.$index F $setRamp)
   status=$(snmpset  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputSwitch.$index i
$setStatus)

   voltage=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputVoltage.$index)
   iLimit=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputCurrent.$index)
   sense=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip
outputMeasurementSenseVoltage.$index)
   current=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip
outputMeasurementCurrent.$index)
   rampspeed=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip
outputVoltageRiseRate.$index)
   status=$(snmpget  -OqvU -v 2c -M $path -m +WIENER-CRATE-MIB  -c guru $ip outputSwitch.$index)

   echo "$voltage $iLimit $sense $current $rampspeed $status"

   let COUNTER=COUNTER+1
done
```

Parameter	Multi	Access	Type
sysMainSwitch	1	R/W	i
sysStatus	1	R/W	i
sysVmeSysReset	1	R/W	i
outputNumber	1	R	i
groupsNumber	1	R	i
outputName	320	R	str
outputGroup	320	R	i
outputStatus	320	R	i
outputMeasurementSenseVoltage	320	R	F
outputMeasurementTerminalVoltage	320	R	F
outputMeasurementCurrent	320	R	F
outputMeasurementTemperature	320	R	i
outputSwitch	320	R/W	i
outputVoltage	320	R/W	F
outputCurrent	320	R/W	F
outputVoltageRiseRate	320	R/W	F
outputVoltageFallRate	320	R/W	F
outputSupervisionBehavior	320	R/W	i
outputSupervisionMinSenseVoltage	320	R/W	F
outputSupervisionMaxSenseVoltage	320	R/W	F
outputSupervisionMaxTerminalVoltage	320	R/W	F
outputSupervisionMaxCurrent	320	R/W	F
outputSupervisionMaxTemperature	320	R/W	i
outputConfigMaxSenseVoltage	320	R	F
outputConfigMaxTerminalVoltage	320	R	F
outputConfigMaxCurrent	320	R	F
outputConfigMaxPower	320	R	F
sensorNumber	1	R	i
sensorTemperature	12	R	i
sensorWarningThreshold	12	R/W	i
sensorFailureThreshold	12	R/W	i
snmpCommunityName	4	R/W	str
psFirmwareVersion	1	R	str
psSerialNumber	1	R	str
psOperatingTime	1	R	i
psDirectAccess	1	R/W	string
fanFirmwareVersion	1	R	string
fanSerialNumber	1	R	string
fanOperatingTime	1	R	i
fanAirTemperature	1	R	i
fanSwicthOffDelay	1	R/W	i
fanNominalSpeed	1	R/W	i
fanNumberOfFans	1	R	i
fanSpeed	6	R	i