MPOD HV & LV

Power Supply System

Technical Manual

30. June 2020

Version 3.2

General Remarks

The only purpose of this manual is a description of the product. It must not be interpreted as a declaration of conformity for this product including the product and software.

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Control Cabinet

In the context of this user manual, the control cabinet must fulfill the requirements on fire-protective enclosures according to EN 60950 / IEC 60950 / UL 60950.

All devices are intended for operation in control cabinets or in closed areas. The LAN connection and all wire connections between the different system parts must be done via shielded cable with conductive connector shells, which are fixed with screws.

Furthermore, an additional fire-protective enclosure is required which must not affect proper air circulation.

Mains Voltage and Connection

The Power supplies are equipped with a “World”- mains input (rated voltage range: 100-240 VAC, frequency: 50-60 Hz, rated current: 16 A). Before connecting to the mains please double-check correspondence.

Mains input connection at the power supply side is done with a 3-pin HIRSCHMANN connector or power terminals. There is no main fuse inside. A circuit breaker for overcurrent protection 16A, type B or C (EN / IEC 60898, VDE 0641), has to be installed externally.

Before disconnection the HIRSCHMANN connector, the power supply should be switched into standby state. (Use the ON/OFF-Switch of the front pannel of the MPOD system)

Hirschmann.	Signal	Description	Color of the Wire
Pin 1	L	Phase	black or brown
Pin 2	N	Return, Neutral	blue
Pin 3		not connected	
Earth	PE	Protective Earth	green/yellow

Connection to Earth

Safety

After connecting the Power box to the mains, the mains input module is powered permanently. Filter and storage capacitors of the power factor correction module are charged with about **400VDC**. Any DC-On-Signal as well as a power switch at control board (if any installed) operates as a low voltage DC on/off switch only and not as a mains breaker. **Therefore it becomes dangerous if the box cover is open. In this case a lot of components on high voltage potential get touchable!**
Before starting any kind of work inside the power box remove the unit from mains and wait a couple of minutes with your activities! Discharge the primary DC Filter-capacitors by use of a well isolated 22 ohm 10W resistor.
We recommend in case of any malfunction to send the power box to Wiener or to one of our representative for service

The backplane is connected to 385 V DC voltage. So never touch the backplane or its connectors!

EU Declaration of Conformity (DoC)

We

Company name:	W-IE-NE-R Power Electronics GmbH
Postal address:	Linde 18
Postcode, City:	51399 Burscheid
Contry:	Germany
Telephone number:	+49-2174-678-0
E-Mail address:	info@wiener-d.com

declare that the DoC is issued under our sole responsibility and belongs to the following products:

Apparatus model/Product:	Mpod Power Supply System
Type:	0P09.xxxx,0316.xxxx, 0BP0.9xxx, 0R00.00xx
Apparatus model/Product:	Mpod mini/micro Power Supply System
Type:	0377.xxxx

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

Low Voltage Directive (LVD) 2014/35/EU
Electromagnetic Compatibility (EMC) Directive 2014/30/EU

The following harmonised standards and technical specifications have been applied:

Title, Date of standard/specification:	
Safety	
EN 62368-1:2014	Audio/video, information and communication technology equipment — Part 1: Safety requirements
EN 60950-1:2006	Information technology equipment – Safety
EN 61010-1:2010	Safety requirements for electrical equipment for measurement,control, and laboratory use
EN 61000-6-3:2007	**Störaussendung [emmission] resitential, commercial and light-industry evnironments]**
EN61326-1:2013 Cl. A/B (emmission)	**Electrical equipment for measurement, control and laboratory use - EMC**
EN 55022:2010 Cl. A/B	**Störaussendung [RF Emmission] Information technology equipment**
EN 55022:2010 Cl. B	Störspannung [conducted noise]
EN 55022:2010 Cl. A/B	Störfeldstärke [radiated noise]
EN 55015-1:2006	Knackstörungen [clicks
EN 61000-3-11:2000	Spannungsschwankungen [flicker]
EN 61000-3-12:2011	Oberschwingungen [harmonics]
EN 61000-6-2:2005	**Störfestigkeit [immunity] industrial environments]**
EN61326-1:2013 Cl. A (immunity)	**Electrical equipment for measurement, control and laboratory use - EMC**
EN 55024:2010	**Störfestigkeit [immunity] Information technology equipment**
EN 61 000-4-2:2010	ESD
EN 61 000-4-3:2011	HF-Felder [radiated HF fields]
EN 61 000-4-4:2013	Burst
EN 61 000-4-5:2015	Surge
EN 61 000-4-6:2014	HF-Einströmung [injected HF currents]
EN 61 000-4-8:2010	Mangn. Feld [magn. fields]
EN 61 000-4-11:2005	Spannungs-Variationen [voltage variations]

Signed for and on behalf of:

Burscheid	2018-02-14	Andreas Köster, General Manager
Place of issue	Date of issue	Name, function, signature

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1 General Information

MPOD crate with mixed low and high voltage modules

1.1 MPOD Features

MPOD is a mainframe for multi-channel high voltage (HV) and low voltage (LV) power supply modules. A unique flexibility is given by outfitting the MPOD crate with either the LV or HV backplane only or with both to allow combined use of LV and HV modules. The full size MPOD crate has 10 slots for power modules which provides a high number of output channels. Its modular design makes the customer able to easily replace the fan tray, the controller, the primary power supply or the optional air filter.

- 10 module slots for up to 80 LV channels / 480 HV channels
- 8U high for bottom cooling air intake, optional dust filter
- Modules and controller outputs can be placed either at front or rear side (picture above shows front side)
- LV: 8/4 channels (0- 8/16/30/60V/120V, 50/100W / channel, floating ground 125V/opt. 500V))
- HV: 48/32/24/16/8 or 4 channels (0 - 2.5/4/6kV/8kV/10kV/20kV), channel- or module wise floating or common ground
- Low noise and ripple
- Individually controlled output channels (voltage and current), programmable warning and trip levels
- MPOD Controller with Ethernet (TCP/IP) / CANbus / USB combi-interface, Interlock
- Ethernet port with integrated Web server, programmable with SNMP protocol via TCP/IP, OPC
- CE conform EN 50 081/82 part 1 (EN 50 022 B)
- safety in accordance with EN 60 950
- Sinusoidal mains current EN 61000-3-2

1.2 MPOD Crate - standard types

The following crate types are standardized configurations with 8U high chassis.

Other configurations and mixed system with part of the crate outfitted with PCI or VME backplanes are available on request.

Type	Slots	Remote control interface	Local control / display	Backplane	HV power	Output Position
MPOD EC	10	Ethernet, CAN, USB	-	HV/LV	600W	front
MPOD EC-R	10	Ethernet, CAN, USB	-	HV/LV	600W	rear
MPOD LX	10	Ethernet, CAN, USB	Yes, LCD	HV/LV	600W	front
MPOD LX-R	10	Ethernet, CAN, USB	Yes, LCD	HV/LV	600W	rear
MPOD EC-LV	10	Ethernet, CAN, USB	-	LV	-	front
MPOD EC-LV-R	10	Ethernet, CAN, USB	-	LV	-	rear
MPOD EC-HV	10	Ethernet, CAN, USB	-	HV	600W	front
MPOD EC-HV-R	10	Ethernet, CAN, USB	-	HV	600W	rear
MPOD 2H	10	Ethernet, CAN, USB	-	HV	1200W	front
MPOD 2H-R	10	Ethernet, CAN, USB	-	HV	1200W	rear
MPOD 2H-LX	10	Ethernet, CAN, USB	Yes, LCD	HV	1200W	front
MPOD 2H-LX-R	10	Ethernet, CAN, USB	Yes, LCD	HV	1200W	rear

(CAN-bus for HV modules only, disabling Ethernet communication may be necessary for ISEG CAN-HV control software)

MPOD LX crate with reversed card cage

1.3 MPOD Mini crate

The WIENER MPOD mini crate represents a compact 19” rack mountable chassis for up to 4 MPOD low and high voltage modules. The MPOD mini crate includes the primary power supply with 600W power for high voltage modules as well as a cooling system with high performance DC fan. It can be outfitted with HV backplane for us as a high voltage system only or with both

HV and LV backplanes.
The first half slot is reserved for the MPOD Controller which manages the primary power supplies and provides Ethernet, USB and CAN-bus interfaces for remote monitoring and control. Please note that it is possible to switch the MPOD crate off and on off remotely when the front panel switch is in ON position.

MPOD Mini crate with MPOD controller and 2 high voltage + 1 low voltage module

1.4 MPOD Micro crate

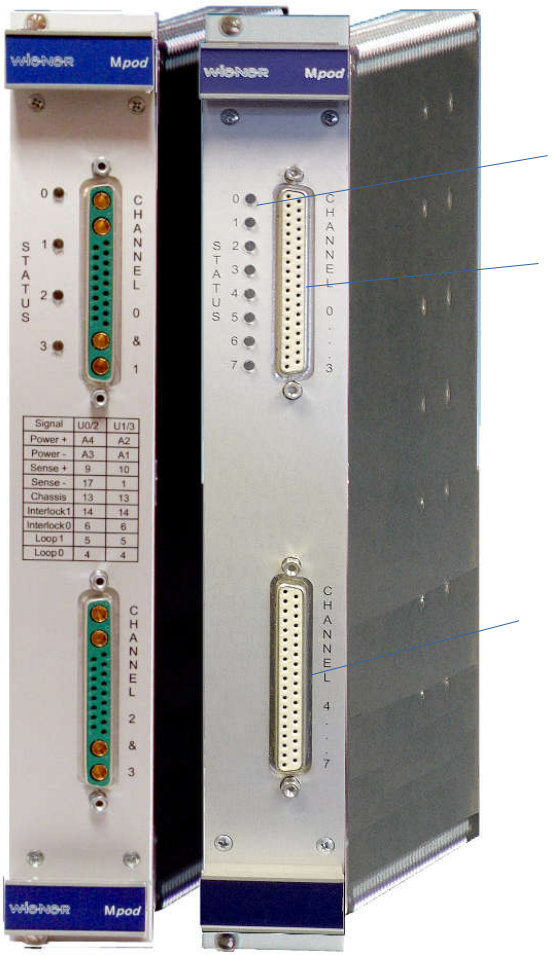
The MPOD micro crate is the smallest and low cost option for the WIENER multi-channel high and low voltage power supply system. The MPOD micro mainframe can house 1 or 2 plug-in low or high voltage modules. The integrated MPOD controller card provides10/100 Ethernet, CAN bus and USB-2 interfaces.

MPOD micro_2 crate with MPOD controller ,one low voltage and one high voltage module

2 LV Modules

The MPV MPOD Low Voltage modules are available with either 4 or 8 channels for different voltage ranges with 8V, 16V, 30V, 60V maximum respectively. Special modules with up to 120V are under development. All MVP modules have the following features:

- 6U height, 220mm deep fully shielded mechanics
- All DC outputs with individual return lines, individually sensed, floating channel to channel and channel to chassis ground (125V, 500V tested)
- Low noise and ripple (<3mV at 20MHz bandwidth)
- Voltage and current settings / monitoring for each channel, 15 bit resolution, accuracy +/-0.1% of full scale value
- Current monitoring and limiting for each channel, 15 bit resolution, accuracy +/-0.05% of full scale value
- high stability, 0.2%/10k
- Programmable channel parameters:
  - voltage, under voltage / over voltage trip point
  - current limit
  - power, regulation type, internal / externl sense
  - ramping speed up and down (1V/s … 500V/s)
  - group features / error handling
- programming and monitoring via Ethernet (TCP/IP) and USB
- Connectors: 2 x 8 pin high current sub-D, 37 pin sub-D for sense / control or



2.1 MPOD Low Voltage Module Versions

MPOD Low Voltage Series - 8 channels with floating ground

Type	Channels	Voltage	I Max	Peak Power	V-Res	I-Res	Ripple
MPV 4008I	4	0 to 8V	20A	100W/ ch.	0.5mV	0.5mA	<3mVpp
MPV 8008I	8	0 to 8V	10A	50W / ch.	0.5mV	0.5mA	<3mVpp
MPV 8008LI	8	0 to 8V	5A	40W / ch.	0.5mV	0.25mA	<3mVpp
MPV 4016I	4	0 to 16V	10A	100W/ ch.	1mV	0.25mA	<2mVpp
MPV 8016I	8	0 to 15V	5A	50W / ch.	1mV	0.25mA	<2mVpp
MPV 4030I	4	0 to 30V	5A	100W/ ch.	2mV	0.12mA	<2mVpp
MPV 8030I	8	0 to 30V	2.5A	50W / ch.	2mV	0.12mA	<2mVpp
MPV 4060I	4	0 to 60V	2A	100W/ ch.	4mV	0.06mA	<2mVpp
MPV 8060I	8	0 to 60V	1A	50W / ch.	4mV	0.06mA	<2mVpp
MPV 8120I	8	0 to 120V	100mA	50W / ch.	4mV	4 µA	<10mVpp

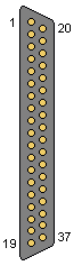
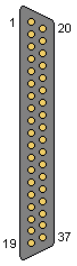
I = Interlock, with sub **D** 37 pin female connector.

MPOD Low Voltage mating connectors

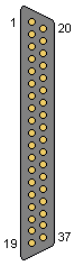
Sub-D 37 extension cable 5m	37	Combined power/sense for 4 channels
Sub-D 37 extension cable 25m	37	Combined power/sense for 4 channels

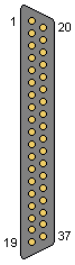
Connectors are **IEC807-3/DIN41652** conform. Custom made cable sets are available on request.

2.2 Combined Power & Sense Connector Pin Assignment MPV 8xxxI (8 channel)

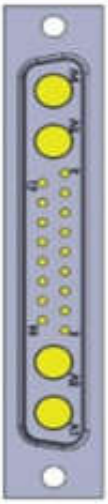
SUB37 female (Channel 0 … 3)	Pin	Signal	Top Connector
	1 - 3	U0-	Channel 0 negative output
	20 - 22	U0+	Channel 0 positive output
	4	S0-	Channel 0 negative sense input
	23	S0+	Channel 0 positive sense input
	5 - 7	U1-	Channel 1 negative output
	24 - 27	U1+	Channel 1 positive output
	8	S1-	Channel 1 negative sense input
	27	S1+	Channel 1 positive sense input
	9 - 11	U2-	Channel 2 negative output
	28 - 30	U2+	Channel 2 positive output
	12	S2-	Channel 2 negative sense input
	31	S2+	Channel 2 positive sense input
	13 - 15	U3-	Channel 3 negative output
	32 - 34	U3+	Channel 3 positive output
	16	S3-	Channel 3 negative sense input
	35	S3+	Channel 3 positive sense input
	17	INTERLOCK0	Interlock input: The four channels of this connector are
	36	INTERLOCK1	enabled only if a signal is applied here
	18	LOOP0	Safety Loop, LOOP0 and LOOP1 are connected to each other, no
	37	LOOP1	connection to other potentials
	19	CHASSIS	Connected to chassis / front panel
SUB37 female (Channel 4..7)	**Pin**	**Signal**	**Bottom Connector**
	1 - 3	U4-	Channel 4 negative output
	20 - 22	U4+	Channel 4 positive output
	4	S4-	Channel 4 negative sense input
	23	S4+	Channel 4 positive sense input
	5 - 7	U5-	Channel 5 negative output
	24 - 26	U5+	Channel 5 positive output
	8	S5-	Channel 5 negative sense input
	27	S5+	Channel 5 positive sense input
	9 - 11	U6-	Channel 6 negative output
	28 - 30	U6+	Channel 6 positive output
	12	S6-	Channel 6 negative sense input
	31	S6+	Channel 6 positive sense input
	13 - 15	U7-	Channel 7 negative output
	32 - 34	U7+	Channel 7 positive output
	16	S7-	Channel 7 negative sense input
	35	S7+	Channel 7 positive sense input
	17	INTERLOCK0	Optional interlock input: The four channels of this connector are
	36	INTERLOCK1	enabled only if a signal is applied here
	18	LOOP0	Safety Loop, LOOP0 and LOOP1 are connected to each other, no
	37	LOOP1	connection to other potentials
	19	CHASSIS	Connected to chassis / front panel

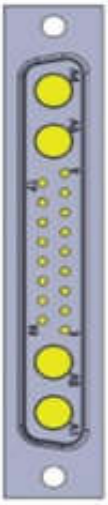
2.3 Combined Power & Sense Connector Pin Assignment MPV 4xxxI (4 channel)

DSUB37 male (Channel 0..1)	Pin	Signal	Top Connector
	20 - 26	CH0+	Channel 0 positive output
	01 - 07	CH0-	Channel 0 negative output
	27	S0+	Channel 0 positive Sense Input
	08	S0-	Channel 0 negative Sense Input
	28 - 34	Ch1+	Channel 1 positive output
	09 - 15	Ch1-	Channel 1 negative output
	35	S1+	Channel 1 positive Sense Input
	16	S1-	Channel 1 negative Sense Input
	17	INTERLOCK0	Interlock input: The two channels of this connector are
	36	INTERLOCK1	enabled only if a signal is applied here
	18	LOOP0	Safety Loop: LOOP0 and LOOP1 are connected to each other, no
	37	LOOP1	connection to other potentials
	19	CHASSIS	Connected to chassis / front panel

DSUB37 male (Channel 2..3)	Pin	Signal	Top Connector
	20 - 26	CH2+	Channel 2 positive output
	01 - 07	CH2-	Channel 2 negative output
	27	S2+	Channel 2 positive Sense Input
	08	S2-	Channel 2 negative Sense Input
	28 - 34	Ch3+	Channel 3 positive output
	09 - 15	Ch3-	Channel 3 negative output
	35	S3+	Channel 3 positive Sense Input
	16	S3-	Channel 3 negative Sense Input
	17	INTERLOCK0	Interlock input: The two channels of this connector are
	36	INTERLOCK1	enabled only if a signal is applied here
	18	LOOP0	Safety Loop: LOOP0 and LOOP1 are connected to each other, no
	37	LOOP1	connection to other potentials
	19	CHASSIS	Connected to chassis / front panel

2.4 Power & Combined Power & Sense Connector MPV4x xxI1 (4 channel)

DSUB 21WA4 female (Channel 0+1)	Pin	Signal	Top Connector
	A4	U0+	Channel 0 positive output
	A3	U0-	Channel 0 negative output
	9	S0+	Channel 0 positive sense input
	17	S0-	Channel 0 negative sense input
	13	Chassis	Connected to chassis /front panel
	14	Interlock1	Optional Interlock input: The two channels of this connector
	6	Interlock0	are on enabled only if a signal is applied here
	5	Loop1	Safety Loop, LOOP0 and LOOP1 are connected to each other,
	4	Loop0	no connection to other potentials
	10	S1+	Channel 1 positive sense input
	1	S1-	Channel 1 negative sense input
	A2	U1+	Channel 1 positive output
	A1	U1-	Channel 1 negative output

DSUB 21WA4 female (Channel 2+3)	Pin	Signal	Bottom Connector
	A4	U2+	Channel 2 positive output
	A3	U2-	Channel 2 negative output
	9	S2+	Channel 2 positive sense input
	17	S2-	Channel 2 negative sense input
	13	Chassis	Connected to chassis /front panel
	14	Interlock1	Optional Interlock input: The two channels of this connector
	6	Interlock0	are on enabled only if a signal is applied here
	5	Loop1	Safety Loop, LOOP0 and LOOP1 are connected to each other,
	4	Loop0	no connection to other potentials
	10	S3+	Channel 3 positive sense input
	1	S3-	Channel 3 negative sense input
	A2	U3+	Channel 3 positive output
	A1	U3-	Channel 3 negative output

2.5 SAFETY LOOP and INTERLOCK functionality of MPV modules

The SAFETY LOOP pins provide a closed connection between LOOP0 and LOOP1 in case the properly wired DSUB37 connector is plugged into the MPV module. It does not have any functionality inside the module!

The Interlock option is only available on MPV modules with the I suffix. 2 interlock signals are available, one for all channels connected to one output connector.

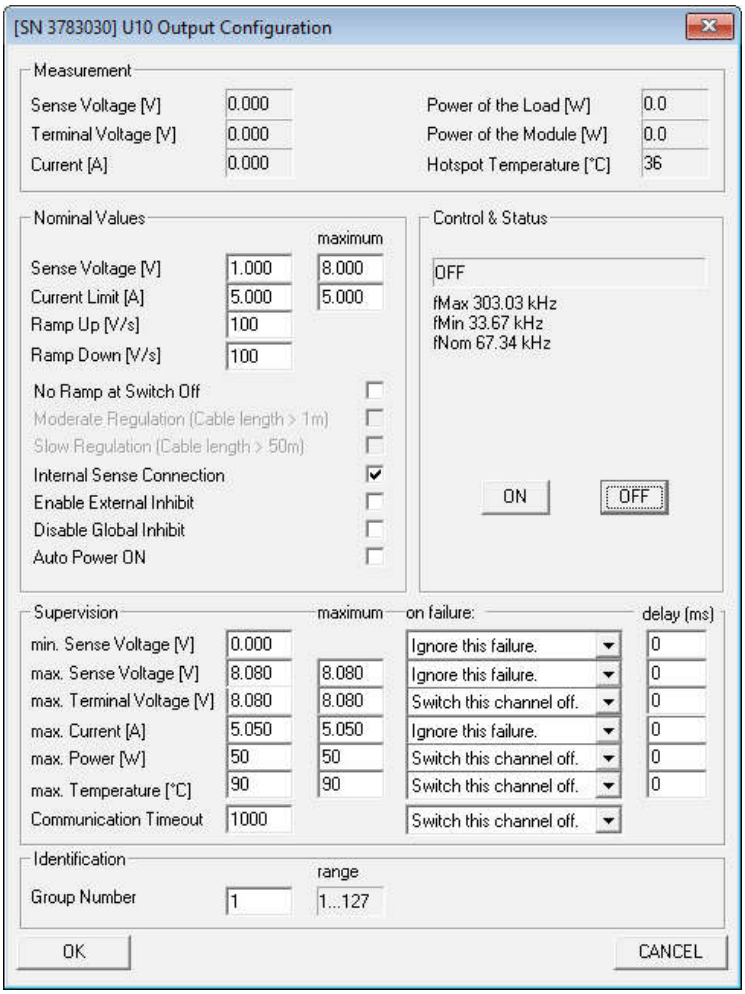
Signal Specification:

INTERLOCK1 Interlock Signal (see specification below), e.g. pin 36 of DSUB37

INTERLOCK0: Interlock return line, isolated from channel GND and chassis GND, e.g. pin 17

	Symbol	Min	Max	Unit
Interlock Enable Voltage	$U_{INTERLOCK}$	+5	+14	V
Current per Channel	$I_{INTERLOCK\_CH}$	($U_{INTERLOCK}$ – 1.3) / 2.2	($U_{INTERLOCK}$ – 1.0) / 2.2	mA
Total Current	$I_{INTERLOCK\_CH}$	MPV8xxx: 4 * $I_{INTERLOCK\_CH}$ MPV4xxx: 2 * $I_{INTERLOCK\_CH}$ MPV2xxx: 1 * $I_{INTERLOCK\_CH}$		mA

In order to use the Interlock function each channel has to be enabled for this. In MUSEcontrol Software, right mouse click on the channel and check in the “Output Configuration” window the check mark “Enable External Inhibit” accordingly.



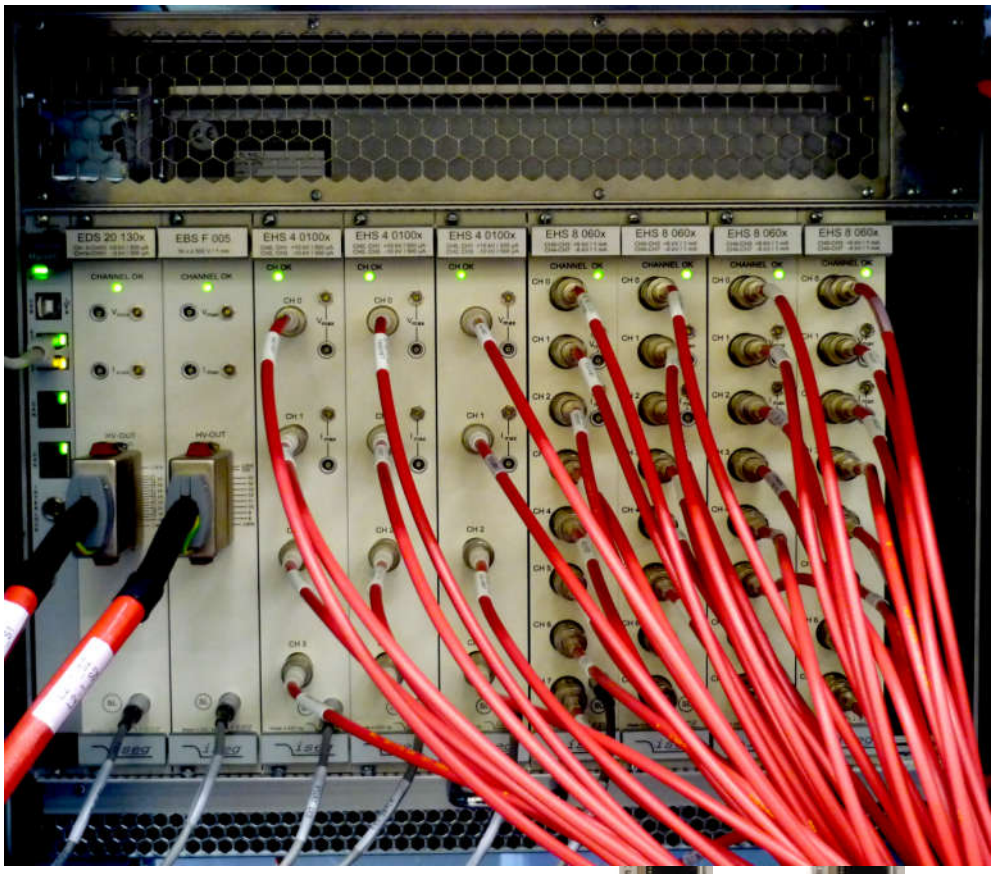
3 HV Modules

MPOD high voltage modules are manufactured by ISEG (www.iseg-hv.com). For technical details please refer to the ISEG manuals and data sheets of the EHS, EBS, EDS and EHQ (discontinued) multi channel high voltage modules. General features are:

- High Voltage modules with 4, 8, 16, 24, 32 or 48 individually controlled channels
- Maximum voltage range from 500V up to 10 kV
- Extremely low noise and ripple: <5mVpp to <10mVpp
- All DC outputs floating or common ground depending on module type
- Voltage and current settings / monitoring for each channel, 16 to 21 bit resolution
- Current monitoring and limiting for each channel, 16 to 21 bit resolution
- Programmable channel parameters, group features
- output connectors:

8 channel modules	SHV or REDEL (<4kV) multi pin Kings for 8kV and 10kV (4 channels only)
16 channel modules	SHV or REDEL (<4kV) multi pin
24 channel modules	REDEL (<4kV) multi pin or AMP 201311-3
32 channel modules	REDEL multi pin
48 channel modules	REDEL multi-pin

ISEG high voltage modules with 4 channels KINGS (10kV), 8 and 16 channels SHV, and 8 / 16 channels REDEL multi-pin connectors (from left to right)



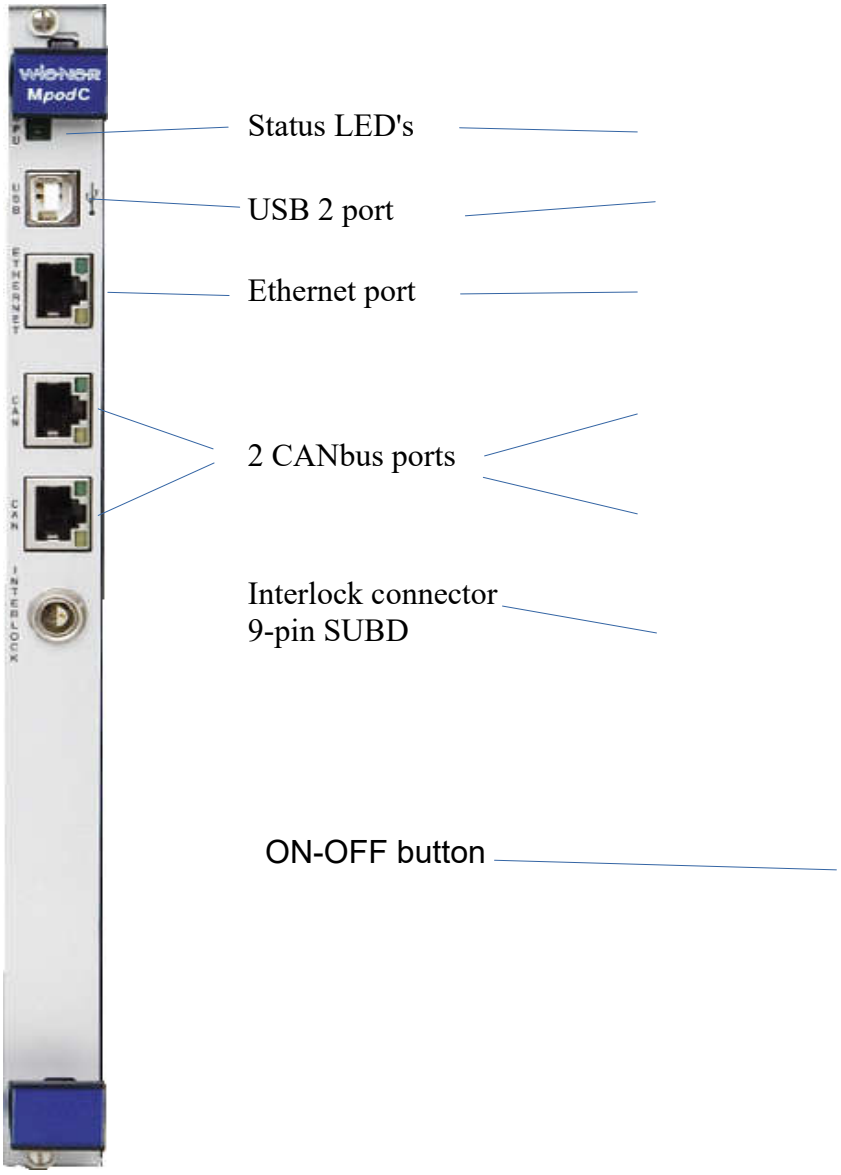
MPOD crate with rear side module option and air filter outfitted with ISEG EDS, EBS and EHS high voltage modules and wired safety loop.

4 MPOD Controller

The MPOD controller which is plugged into the first half slot of the crate controls the primary power supply as well as all inserted LV- and HV-modules. Further it connects these to remote controlling interfaces / services in an unique way.

MPOD Controller features:

- TCP/IP 10M/100M port, auto ranging
- Built-in HTTP server
- TCP/IP protocol with SNMP v.2c for full control of all module parameters
- 2 CAN-Bus ports, wired in parallel for daisy-chaining
- USB 2 interface
- 3 status LED's
- Interlock connector (9pin DSUB)



Old Controller MpodC MpodC with ON/OFF

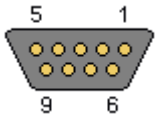
Ethernet port, standard NIC pin layout

RJ45	Pin	Signal	Comment
	1	TX+	
	2	TX-	
	3	RX+	
	4	GND 1	75 Ohm
	5	GND 1	
	6	RX-	
	7	GND 2	75 Ohm
	8	GND 2	

CAN-bus ports

RJ45	Pin	Signal	Comment
	1	CAN-H	
	2	CAN-L	
	3	GND	
	4	n.c.	
	5	n.c.	
	6	reserved	
	7	GND	
	8	n.c.	

Interlock connector

DSUB9 female	Pin	Signal	Comment
	1	CRATE_ENABLE	TTL input (1 kOhm resistor to GND) A high level allows the channels to be switched on by software A low level forces all channels to switch off with their specified down ramp.
	2	CRATE_FAST_OFF	TTL input (1 kOhm resistor to GND) A high level forces all channels to switch off as fast as possible. Any ramp-down settings are ignored.
	3	reserved	
	4	reserved	
	5	GND	Ground reference
	6	CRATE_STATUS	TTL output (1 kOhm resistor to GND, 100 Ohm resistor to protect the output buffer) This signal is driven high, if one or more channels of the MPOD system do have a non-zero output voltage
	7	reserved	
	8	reserved	
	9	(TTL High)	TTL high reference (only for FW 2.1.2607.1 and higher

For set-up of Interlock please use MUSEcontrol in admin mode and enable / disable the Interlock by removing or setting the flag “IGNORE HARDWARE INTERLOCK” in the configuration tab.

5 CC24 Controller (optional Controller istead of MpodC)

The iseg CC 24 series is an intelligent embedded Linux-Server system with preinstalled iseg Communication Server (iCS). The iCS comes with a large set of preconfigured services as EPICS, Web-Control, SNMP, SOAP, Websocket, OPC/UA1, isegHAL and HTTP-API. The iCS also delivers two main web based user applications. iCScontrol provides a quick and smart control interface of the connected hardware by using web-browser without software installation. iCSconfig is used for hardware and service configuration and firmware upgrades. Both can also be run on mobile devices like tablets or smartphones. For native application control several software solutions are available:

- iseg SNMP Control
- isegControl (Linux, Windows, Mac)
- isegHalRemote-Library
- Ethernet and WiFi (opt.) connectivity
- Master (CC24) / Slave (CC23) versions available
- Embedded Linux-Server with iCS control system (Master version)
- Two independent CAN extension ports (for Slave connection)
- Controls crate and module functions
- Digital I/O: Free configurable INHIBIT, INTERLOCK
- Preconfigured services: EPICS, SNMP, HTTP, SOAP, Websocket
- Webbrowser based control and configuration system
- Easy configuration and firmware updates of connected hardware

For more details please see controller manual:

http://file.wiener-d.com/documentation/MPOD/iseg_manual_CC2x_en_14.pdf

6 Local Control

6.1 Introduction

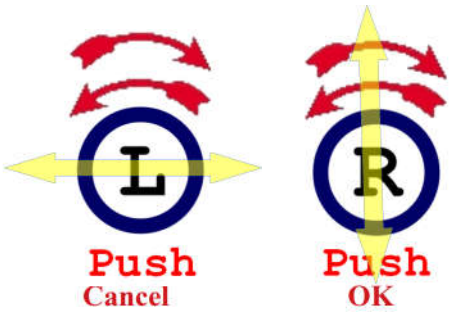
MPOD full size and MPOD mini crates can be optionally equipped with a local color graphic display and two rotary controls.

6.2 Usage of the rotary controls

Please note that the display function and operation changed with MPOD firmware 2.1.xxxx
Connecting MPOD to the AC line will show the following screen:

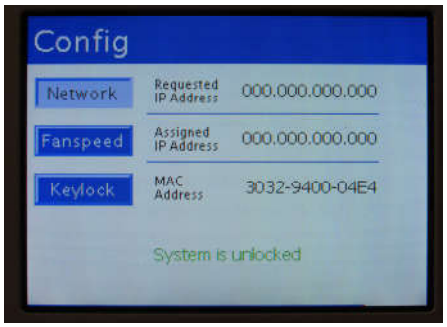
Switching POWER on will power up the MPOD crate and the display will scan the crate for available module.

The two rotary knobs can be rotated and pushed. The right/upper* one controls vertical selections (e.g. to scroll down a menu task or increase/decrease a operating value), while the left/lower* one controls the horizontal selections (e.g. select other menus or sub-menus). By pushing the right/upper* knob (OK) it is possible to select a menu item or to confirm input By pushing the left/lower* knob (CANCEL) it is possible to escape from input fields.

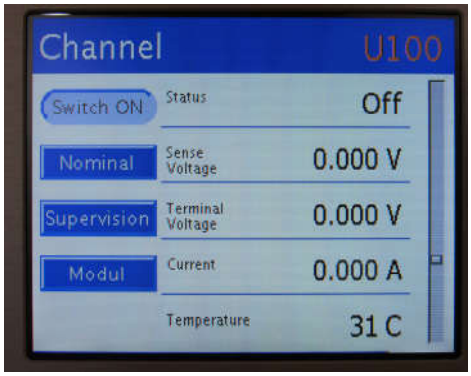


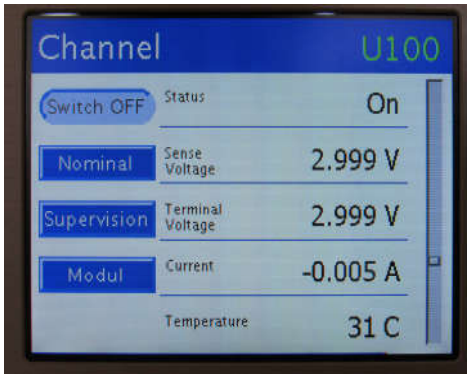
*concerns Mpod Mini, Mpod Micro

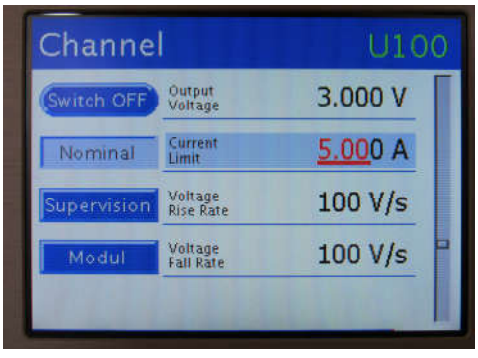
6.3 MPOD Display Main menu

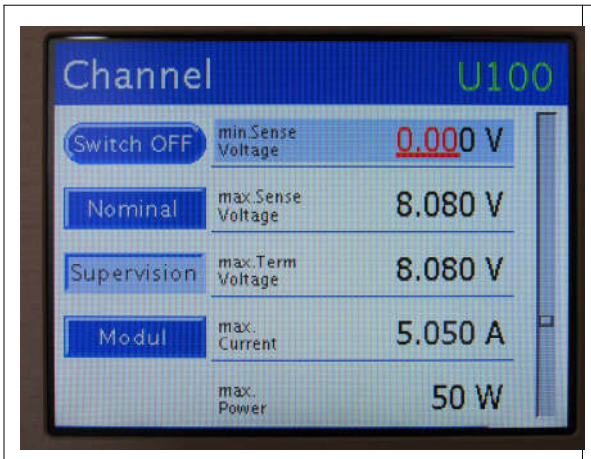
	**Main Window** • Rotate **<R>** to change between **GLOBAL, CHANNEL,CONFIG** and **LOCK**
	**Global Window** • Press **<R>** to go into screen saver mode with high visibilitly channel display • Press **<L>** to go back to the Main Window
	**Channel Window** • Press **<R>** to enter menu to access power supply channels • Press **<L>** to go back to the GLOBAL Window
	**CONFIG Window** • Press **<R>** to enter menu to change **network settings ,fan speed** and to change **Keylock** Password • Press **<L>** to go back to the GLOBAL Window
	**VIEW LOCK** • Press **<R>** to enter menu to activate the Keylock • Press **<L>** to go back to the Main Window

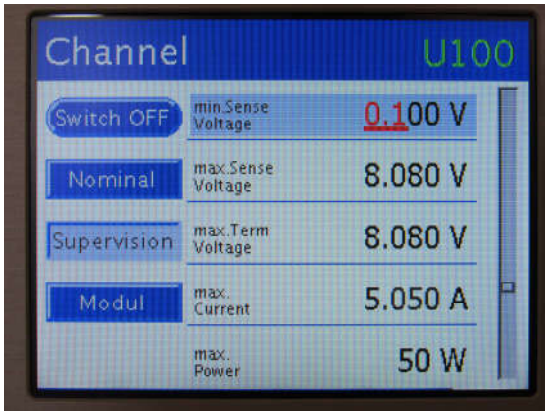
6.4 MPOD Display CHANNEL menu

<table>
<tr>
<td> 


</td>
<td>SWITCH ON / OFF and status Window
• Press <R> to switch channel ON or OFF
• Rotate <R> to change between SWITCH ON/ OFF, NOMINAL ,SUPERVISION and MODUL</td>
</tr>
<tr>
<td> 

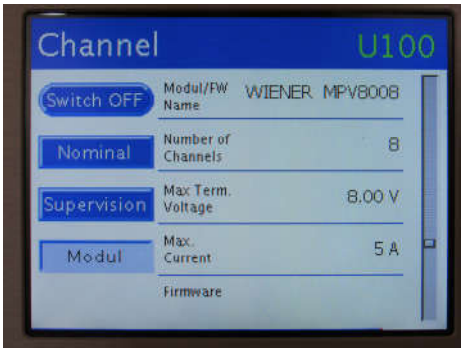

</td>
<td>NOMINAL settings Window
• Press <R> to select parameter (will be marked)
• Rotate <R> to change between Output Voltage, Current Limit or Voltage ramps
• Press <R> to edit value (will be shown in red), change value with <R>, <L> will change resolution digits (red) to allow precise settings
• Press <R> save new values or <L> to discard (cancel)</td>
</tr>
</table>





Supervision settings Window

- Press **<R>** to select parameter (will be marked yellow)
- Rotate **<R>** to change between parameters
- Press **<R>** to edit value (will be shown in red), change value with **<R>, <L>** will change resolution digits (red) to allow precise settings
- Press **<R>** save new values or **<L>** to discard (escape)
- Rotate **<L>** to go back (left) or to select another channel (right) which will mark right button yellow, channel then can be changed with **<R>**



MODUL Window

- **EHS Module example values**

- **MPV Module example values**

7 Remote Control / Software

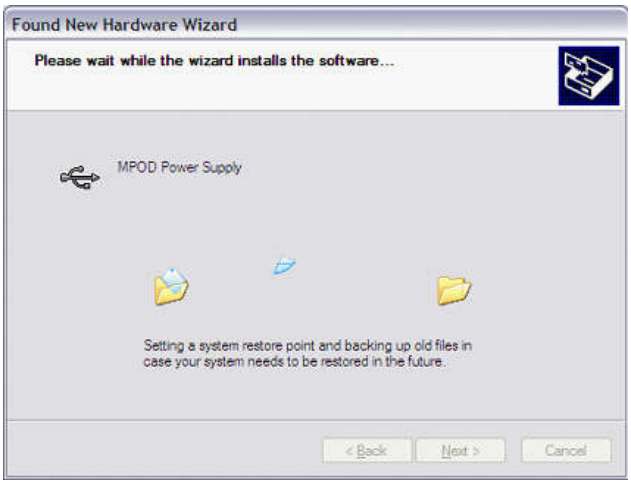
Please check the download section at file.wiener-d.com for the latest version of MPOD software and documentation!

7.1 Software Setup for Microsoft Windows

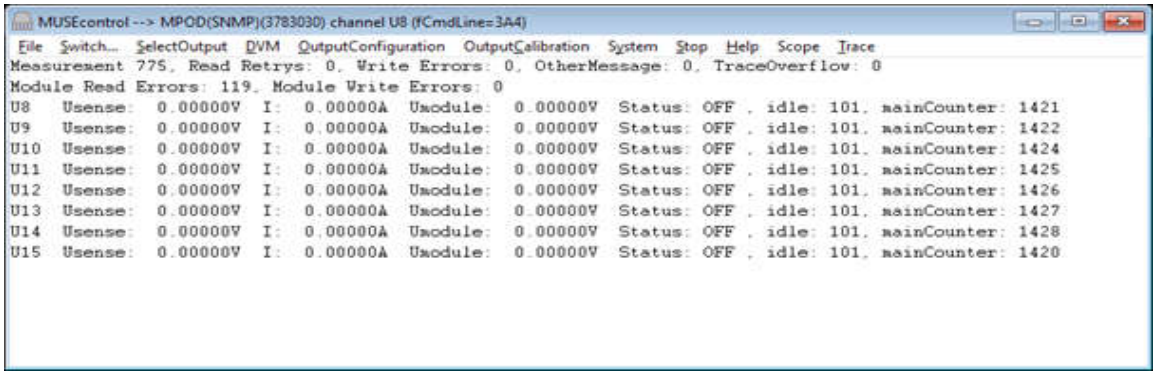
Before the MPOD Controller can be used, it may have to be configured according to the network environment. The factory default configuration is DHCP.

This is done locally via display or by running the MUSEcontrol utility, which allows access via the USB-port of the MPOD Controller with a computer running 32-bit Windows XP, VISTA or Windows 7.

Please download the latest version from the download area at file.wiener-d.com. Run the latest MUSEcontrolInstall program to install all drivers and the USB program itself. It is recommended to define a short path for the driver location during installation. Connecting the MPOD Controller via USB it should be automatically detected and the Silicon Labs USB drivers (SiLib.sys and SiUSBXp.sys) loaded



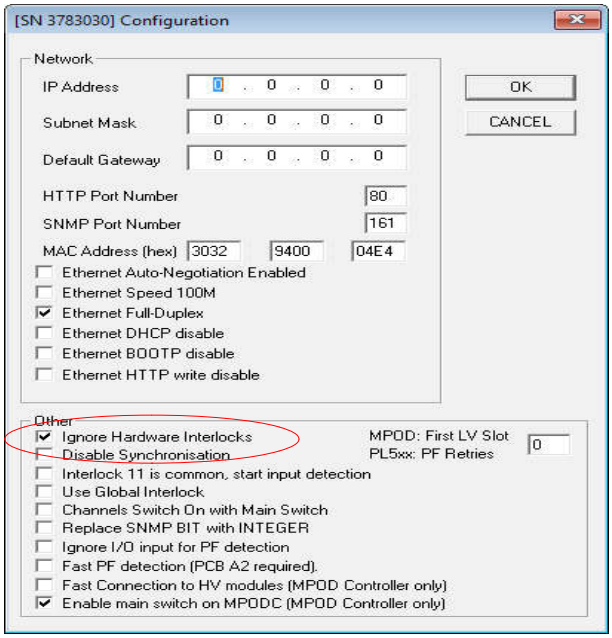
Starting the program, the main window gives a quick overview of the MPOD and its connected MPV low voltage modules. Please note that the MPOD crate has to be switched on in order to show the low voltage modules!



In case no low voltage modules are located in the crate an error message “No module found” will pop up which should be ignored. Note, all ISEG high voltage modules will not be shown and can not be controlled via USB!

To prepare the MPOD controller select System → Configuration which starts the network configuration dialog as shown below. Here you enter the TCP/IP network settings (IP address, subnet mask and default gateway). You have to use the parameters of your local network here. Please contact your network administrator for details. In order to use DHCP (factory default) an I address of 0.0.0.0 has to be selected.

IP address of 0.0.0.0 will enable DHCP.
HTTP and SNMP port numbers should only be modified if you know what you do. Setting any ports to 0 disables the server.
The “First LV Slot” item is only used on old systems / FW versions to define the slot number of the first LV-module. Any HV-module plugged into this slot will not be detected. (This setting is necessary only for older MPOD firmware versions and older MPV modules without automatic detection of their slot numbers)



Enable / Disable MPOD controller interlock
Run MUSEcontrol program in admin mode: "C:\Program Files\W-IE-NE-R\ MUSEcontrol\MUSEcontrol.exe" USB 0x224

- Disable Interlock (Default): check mark **“Ignore Hardware interlock” should be set**
- **Enable Interlock : remove check mark “Ignore Hardware interlock”**

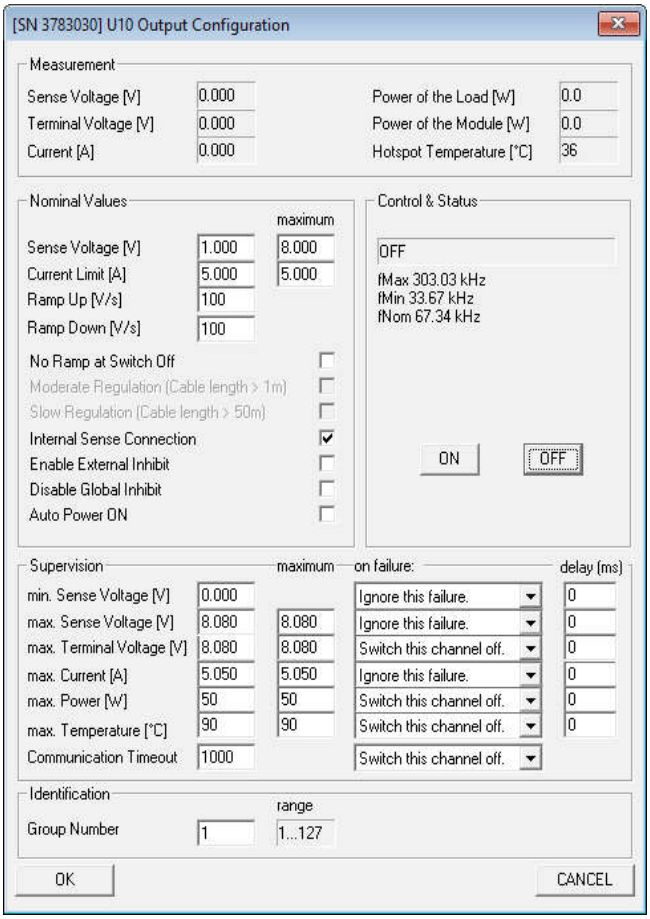
Another essential menu item is the System → FirmwareUpdate which starts the firmware update (see appendix A).

Low Voltage channels can be completely programmed and monitor within the MUSE application. You can switch on or off any channel by clicking at the line of the channel. If you click with the right mouse button, the “OutputConfiguration” dialog is entered:

Enable / Disable fast connection to HV modules
The standard Mpod Controller CAN- BUS communication speed is set to 125kb/s if you enable the checkbox the communication speed will change to 250kb/s

Enable / Disable main Switch on MpodC
Enabled checkbox are for the newer Versions of our Mpod System with integrated Main Switch in the Front Panel of the Controller .
Disabled checkbox are for all other Mpod Systems with Main Switch on the Crate Frontpanel

The dialog is divided into five main sections:



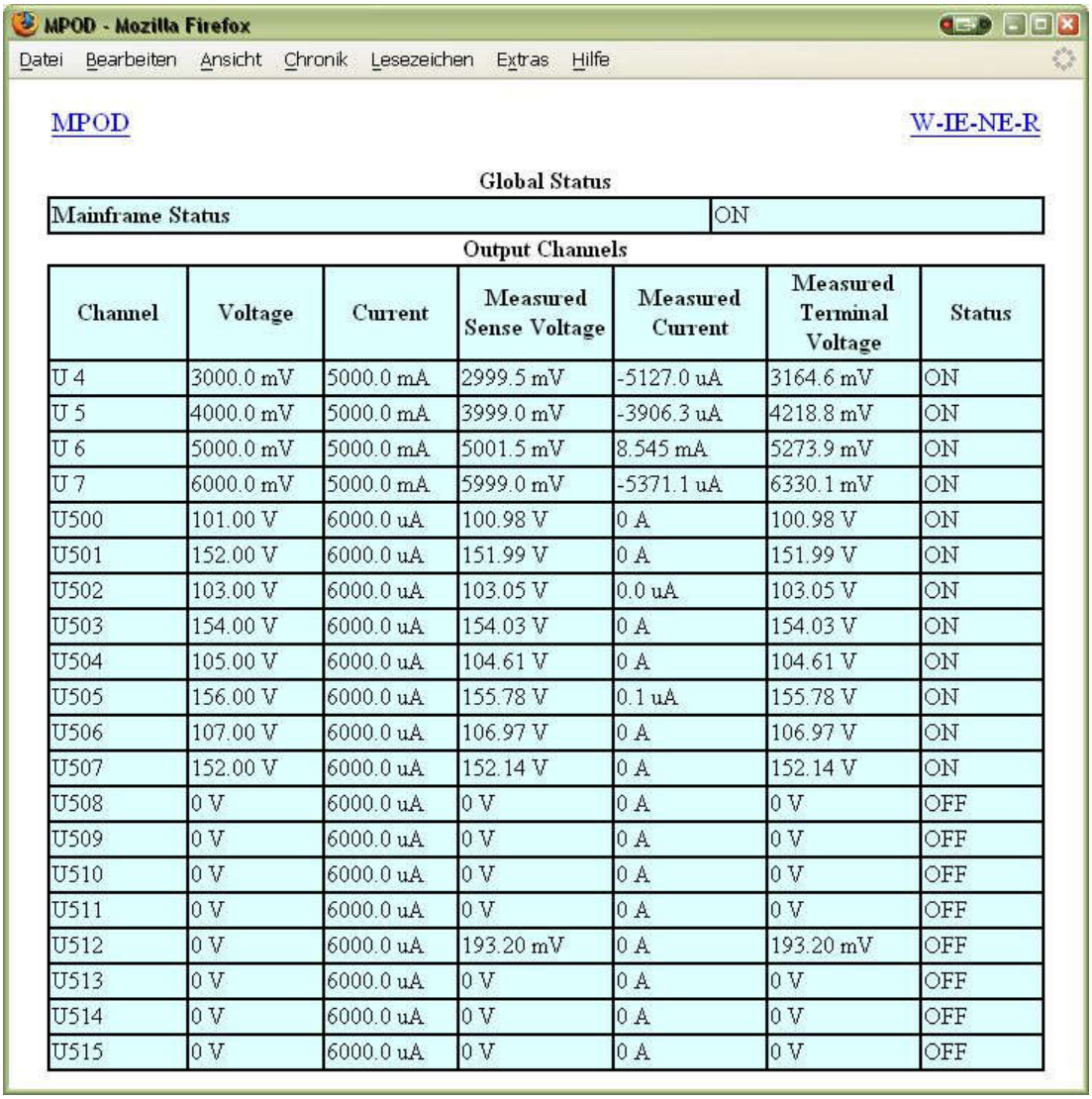
- **Measurement**
  Shows the actual measured sense voltage, terminal voltage (at the module terminals), current, the calculated power and the most critical module temperature.
- **Control & Status**
  Here the channel can be switched on and off. If the channel has switched off because of any failure, the reason is displayed here, too.
- **Nominal Values**
  Here the nominal output voltage (sense voltage), current limit and ramping speeds are entered. The "No Ramp at Switch Off" check box forces immediate switch off.
  The regulation mode can be optimized for different cable lengths (slow regulation requests both check boxes to be checked!)
  We recommend to activate the "Internal sense connection" checkbox if no external sense line is connected on the output
- **Supervision**
  Here the threshold values of the minimum sense voltage, the maximum sense voltage, the maximum terminal voltage, the maximum current, the maximum power, the maximum temperature and the communication timeout can be entered. The right column "maximum" can only be changed by this utility and is the maximum allowed value of the left column. The left column may be changed here or via the TCP/IP network.
  The most right column "on failure" defines the action if the associated threshold is exceeded.
  The "communication timeout" at the last row is an internal timeout of the communication between different processors. If the processor responsible for a specific output has no data from it's master processor for longer than this time (in milliseconds), the output channel will be switched off.
- **Identification**
  Here the group number of this channel can be entered.

Other main menu items associated with this dialog are "Start/Stop" (stop and restart the communication with the MPOD controller via USB) and "SelectOutput", which simple increments the channel number which is displayed by the other dialogs.

The other main menu items are used for test and maintenance and should not used by the customer.

7.2 Web Browser

With a web browser pointing to the IP address as URL it is possible to get an overview of all channels in a simple way.



MPOD W-IE-NE-R

Global Status

Mainframe Status	ON

Output Channels

Channel	Voltage	Current	Measured Sense Voltage	Measured Current	Measured Terminal Voltage	Status
U 4	3000.0 mV	5000.0 mA	2999.5 mV	-5127.0 uA	3164.6 mV	ON
U 5	4000.0 mV	5000.0 mA	3999.0 mV	-3906.3 uA	4218.8 mV	ON
U 6	5000.0 mV	5000.0 mA	5001.5 mV	8.545 mA	5273.9 mV	ON
U 7	6000.0 mV	5000.0 mA	5999.0 mV	-5371.1 uA	6330.1 mV	ON
U500	101.00 V	6000.0 uA	100.98 V	0 A	100.98 V	ON
U501	152.00 V	6000.0 uA	151.99 V	0 A	151.99 V	ON
U502	103.00 V	6000.0 uA	103.05 V	0.0 uA	103.05 V	ON
U503	154.00 V	6000.0 uA	154.03 V	0 A	154.03 V	ON
U504	105.00 V	6000.0 uA	104.61 V	0 A	104.61 V	ON
U505	156.00 V	6000.0 uA	155.78 V	0.1 uA	155.78 V	ON
U506	107.00 V	6000.0 uA	106.97 V	0 A	106.97 V	ON
U507	152.00 V	6000.0 uA	152.14 V	0 A	152.14 V	ON
U508	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U509	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U510	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U511	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U512	0 V	6000.0 uA	193.20 mV	0 A	193.20 mV	OFF
U513	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U514	0 V	6000.0 uA	0 V	0 A	0 V	OFF
U515	0 V	6000.0 uA	0 V	0 A	0 V	OFF

7.3 NetSNMP

NetSNMP is an open source SNMP program which can be used to access the MPOD controller via the **S**imple **N**etwork **M**anagement **P**rotocol. Please see http://net-snmp.sourceforge.net/ for more details.

Please install netSNMP (32-bit version) from the CD-ROM or downloaded from WIENER support web site on the control computer. 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 (Windows: C:\usr\share\snmp\mibs).

The most commonly used net-snmp calls are:

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

Please see the Net-snmp description and help files for detailed instructions and options. All parameters defined for the WIENER MPOD system as well as crates and other power supplies are contained within the WIENER-CRATE-MIB.txt file (see description in there!).

The following community groups are used:

"**public**": for all read operations
"**private**": to switch crate on or off
"**admin**": to change parameters as fan speed or temperature limits
"**guru**": to change HV and LV channel parameters as voltages, current limits, ramps, ...

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 netSNMP. The command line syntax is the same for both windows and Linux (and probably MAC OSX).

For all WIENER-CRATE-MIB library calls 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) c
rate(1) output(3) outputTable(2) outputEntry(1) 2 }

A first communication with the MPOD 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 [OID]

with:

snmpwalk: This command will retrieve a block of information.

-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. 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 MPOD crate.

OID: (optional) Object identifier of the start OID node of the walk, e.g. output. If ommitted, the SNMPv2-MIB tree is used as default value (showing sysDescr.0 ...)

Example for crate with IP address 192.168.2.25:
snmpwalk -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25

returns:
SNMPv2-MIB::sysDescr.0 = STRING: WIENER MPOD (4193086, MPOD 1.1.1.6, MPODslave 1.06)
SNMPv2-MIB::sysObjectID.0 = OID: WIENER-CRATE-MIB::sysMainSwitch.0
SNMPv2-MIB::sysUpTime.0 = Timeticks: (13401) 0:02:14.01
SNMPv2-MIB::sysContact.0 = STRING:
SNMPv2-MIB::sysName.0 = STRING:
SNMPv2-MIB::sysLocation.0 = STRING:
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 paramtere “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 192.168.2.25 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 192.168.2.25 outputName

returns for MPOD system with 2 ISEG EHS HV modules (8 channels each) in slot 2 and 3:
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 channels of two modules.

Module/Channel mapping to SNMP OID suffixes
SNMP is addressing all channels of all modules of one MPOD crate as one single array (or, to be exact, table). A specific item is identified by the OID prefix (e.g. *`WIENER-CRATE-MIB::outputName`),* a separating dot and the OID suffix defining the module and channel.

The syntax of the OID suffix is

`u<module_number (1 digit)><channel_number (2 digits)>`

without leading zeros (so the OID suffix of the very first channel of the module 0 (next to the MPOD controller) is u0 *(not u00 or u000, leading zeros haven to be removed)*.

The module number (0-9) and channel number (0-47 for a 48 channel module), where the first digit is defined by the slot number and the following two by the channel of the particular module in this slot:

Crate Slot	**Module Number**	**Module Channel Number**	**OID suffix** textual form	corresponding OID suffix (numerical form, don't use in standard situations)
1	**0**	**0, 1, 2, .. 47**	**u0, u1, .. u47**	1, 2, .. 48
2	**1**	**0, 1, 2, .. 47**	**u100, u101, .. u147**	101, 102, .. 148
...	**...**	**...**	**...**	...
10	**9**	**0, 1, 2, .. 47**	**u900, u901, .. u947**	901, 902, .. 948

Please note that the textual OID suffix should be used in all standard situations. The textual OID suffix is translated to it's corresponding numerical value by the SNMP client, so no need for the user to do it.

In case of multi crate system sharing one single MPOD controller just use u1000.. .. u1947 for the second crate, and so on.

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 192.168.2.25 outputVoltage

returns for a MPOD system with one 8 channel ISEG EHS HV module in slot 3:
WIENER-CRATE-MIB::outputVoltage.u200 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u201 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u202 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u203 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u204 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u205 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u206 = Opaque: Float: 0.000000 V
WIENER-CRATE-MIB::outputVoltage.u207 = Opaque: Float: 0.000000 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 OID.SUFFIX

snmpset -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip OID.SUFFIX format value
The most common kind of call you will want is to get data from the power supply. This is easily done via the ***snmpget*** command. The example below retrieves information about whether the main power for the crate is on. If you wish to test this example on your own system replace "$path" with the path to WIENER-CRATE-MIB.txt (/usr/share/snmp/mibs by default and "$ip" with the ip address of your MPOD (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 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 private $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 (see full list in chapter 6.10):

Value Name	Type	Access	Comments
outputVoltage	Float	R/W	The Channel set Voltage
outputCurrent	Float	R/W	The channel current limit
outputMeasurementSenseVolta	Float	R	Actual channel Voltage at sense

ge			line
outputMeasurementTerminalVoltage	Float	R	Actual channel Voltage at terminal
outputMeasurementCurrent	Float	R	Actual channel current
outputSwitch	Integer	R/W	Turns channel ON / OFF, emergency off, reset error flags
outputVoltageRiseRate	Float	R/W	Channel ramp rate up
outputVoltageFallRate	Float	R/W	Channel ramp 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 MPOD 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.index 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 write**		**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

MPOD 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 ISEG modules with common ramp the channel-ID can be any channel of the module! For write access "guru" is needed:

snmpset -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c guru $ip outputVoltageRiseRate.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 MPOD 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 write**	**Off (0)**	
			On (1)
			resetEmergencyOff (2)
			setEmergencyOff (3)
			disableKill (4),
			enableKill (5),
			clearEvents (10)

Examples:

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)

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)

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)

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)

7.4 ISEG High voltage module special commands

Item	Type	Access	Unit	Range	
outputVoltageRiseRate	**float value**	**read-write**	**[V/s]**	**2V/s - 20% Vnom**	
				1% (KILL enabled)	

ISEG high voltage 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. For ISEG high voltage modules with 2 PCB's each of the sub-grups of one PCB may have one ramp value. In this case one should set the ramp twice by using a low and high channel number. ISEG EHQ, EHS, EDS and EBS modules

typically have a ramp rate range from 1V/s …. 20% of Vnom (max. nominal voltage). In case KILL is enabled the maximum ramp rate is reduced to 1% 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 value**	**read-write**	**[A/s]**	**2 - 100% nom. Val.**
outputCurrentFallRate	**float value**	**read-write**	**[A/s]**	**2 - 100% nom. Val.**

DESCRIPTION
The **outputCurrentRiseRate** and **outputCurrentFallRate** accesses one data point of the HV modules and therefore will be reply always the same value.

Item	Type	Access	Unit	Range
outputTripTimeMaxCurrent	**integer**	**read-write**	**[ms]**	**16 – 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 / Switch functions
outputStatus	**bits**	**read**	**outputEnableKill (13)**
			outputEmergencyOff (14)
outputSwitch	**integer**	**read-write**	**Off (0)**
			On (1)
			resetEmergencyOff (2)
			setEmergencyOff (3)
			clearEvents (10)

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

If the channel is On, and the write value is Off, then the channel will switch off.
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.

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 have the state **EmergencyOff**, which means that the High Voltage will switch off without a ramp and reset of the **outputVoltage** to null volt.

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**	**write**	**Off (0),**
			On (1)
			resetEmergencyOff (2)
			setEmergencyOff (3),
			disableKill (4)
			enableKill (5)
			clearEvents (10)

DESCRIPTION
Read: This function is not defined with groups of output channels.

Write: 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. 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.

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 s**etEmergencyOff**, then all channels will have the state **EmergencyOff**, which means that the High Voltage will switch off without a ramp and reset of the **outputVoltage** to null volt.

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 **clearEvents**, then all failure messages of the **outputStatus** will be reset (all channel events, all module events and the state **EmergencyOff**).

Item	Type	Access
outputSupervisionBehavior	**integer**	**read-write**

DESCRIPTION
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:
WIENER LV devices

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.

iseg HV devices

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**.

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

The iseg HV devices can use the bit fields:
outputFailureMaxCurrent support of the function delayed trip

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

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.

Settings for **outputSupervisionBehavior:**

Action	**outputFailureMaxCurrent**	**outputFailureInhibit**
ignore the failure	0	0
switch off this channel by ramp down the voltage	64	4096
switch off this channel by set a internal EmergencyOff	128	8192
switch off the whole board of the HV module by set EmergencyOff	192	12288

Attention!!! In order to use delayed software trips please make sure to have a firmware on the ISEG high voltage modules which supports this feature. Please see the following table of supported firmware releases. In case of older firmware the software trip will not act, i.e. the error will be detected but no action (ram down of channel) will happen.

Name of firmware	**Release or higher**	**Date**	**Description**	**Device class**
E16D0	4.25	05/08/09	EDS 16/32 channel distributor module, with Vmax from $V_{O\,max}$ to ($V_{O\,max}$ - 1kV)	1
E16D1	4.25	05/08/09	EDS 16/32 distributor module	21
E08C0	2.22	02/23/09	EHS 4/8/16 channel, common GND module	24
E08F0	2.27	12/18/08	EHS 4/8/16 channel, floating GND module	25
E08F2	4.06	06/23/09	EHS 4/8/16 channel, floating GND module, 2 ranges for measurement of current	26
E08B0	1.02	07/10/09	EBS 8/16 bipolar channels, distributor module	28

Example of necessary SNMP commands for the delayed trip function:
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 groupsSwitch.64 i 4
disableKill
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputVoltage.u100 F 60
60.000000 V
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputSwitch.u100 i 1
On
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputVoltage.u100
60.000000 V
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputMeasurementSenseVoltage.u100
60.104588 V
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputMeasurementCurrent.u100
0.000001 A
snmpgetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputMeasurementCurrent.u100
0.000000735 A
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputSupervisionBehavior.u100
0
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputSupervisionBehavior.u100 i 64

64
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputSupervisionBehavior.u100
64
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputTripTimeMaxCurrent.u100
0 ms
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputTripTimeMaxCurrent.u100 i 3000
3000 ms / delay of 3 sconds */*
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
***"80 "** /* outputOn */*
snmpgetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputMeasurementCurrent.u100
0.000000735 A
snmpsetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputCurrent.u100 F 0.0000007
0.000000700 A
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
*"04 08 " /*outputFailureMaxCurrent, outputRampDown */*
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
"04 " / outputFailureMaxCurrent */*
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputSwitch.u100 i 10
clearEvents
snmpsetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputCurrent.u100 F 0.00001
0.000010000 A
snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.2.25 outputSwitch.u100 i 1
On
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
"80 10 " / outputOn, outputRampUp */*
/ a load has been switched on channel 0 to bring them in state CC current limited */*
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
"80 20 " / outputOn, outputCurrentLimited */*
.
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
"80 20 " / outputOn, outputCurrentLimited */*
/ the delayed trip fuction ramps the voltage after 3 seconds to zero */*
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.2.25 outputStatus.u100
"04 08 " / outputFailureMaxCurrent, outputRampDown */*

7.5 ISEG Load unit module commands

Item	Type	Access	Unit
outputMeasurementTerminalVoltage	**float**	**read**	**[V]**
outputMeasurementCurrent	**float**	**read**	**[A]**

DESCRIPTION

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

Item	Type	Access	Switch functions
outputSwitch	**integer**	**read-write**	**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 **setExternalMeasurementOn** activates the voltage and current measurement outputs for the channel.

The value **setRippleMeasurementOn** activates the ripple measurement output for the channel.

The value **setExternalAndRippleMeasurementOn** activates all three measurement outputs for the channel.

The value **setExternalAndRippleMeasurementOn** deactivates all measurement outputs for 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.

7.6 ISEG Module commands

Item	Type	Access
moduleDescription	octet string	read

Reply:

Company name, firmware name, channel number, serial number

for instance iseg, E24D1, 24, 713100, 5.03

Item	Type	Access
moduleAuxiliaryMeasurementVoltage0	float	read

Returns the measurement value of the line supply 24 Volt.

moduleAuxiliaryMeasurementVoltage1	float	read

Returns the measurement value of the line supply 5 Volt.

7.7 WIENER MPV Module commands

outputUserConfig OBJECT-TYPE
-- FROM WIENER-CRATE-MIB
SYNTAX Integer32 (0..127)
MAX-ACCESS read-write
STATUS current

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.

outputSupervisionBehavior OBJECT-TYPE
-- FROM WIENER-CRATE-MIB
SYNTAX Integer32 (0..65535)
MAX-ACCESS read-write
STATUS current
DESCRIPTION "A bit field packed into an integer which define the behavior 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:

WIENER LV devices

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.

iseg HV devices

0 ignore the failure

1 switch off this channel by ramp down the voltage

2 switch off this channel by a emergencyOff

3 switch off the whole board of the HV module by emergencyOff.

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

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 "

7.8 Change of community names / setting of passwords

For the communication with MPOD modules 4 types of SNMP communities are used, "**public**", "**private**", "**admin**"and "**guru**". By default the community names are equal to the community types.

snmpwalk -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 snmpCommunityName
WIENER-CRATE-MIB::snmpCommunityName.public = STRING: "public"
WIENER-CRATE-MIB::snmpCommunityName.private = STRING: "private"
WIENER-CRATE-MIB::snmpCommunityName.admin = STRING: "admin"
WIENER-CRATE-MIB::snmpCommunityName.guru = STRING: "guru"

snmpwalk -v 2c -m +WIENER-CRATE-MIB -c private 192.168.0.80 snmpCommunityName
WIENER-CRATE-MIB::snmpCommunityName.public = STRING: "public"
WIENER-CRATE-MIB::snmpCommunityName.private = STRING: "private"

In order to secure the MPOD system communication the community names can be used as passwords and be changed accordingly. The following example shows how the change and test the community names. Using a wrong community name will result in a time out error. Please note, that especially the communities with write access (private, admin, guru) should be protected.

snmpset -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 snmpCommunityName.guru s seCrET

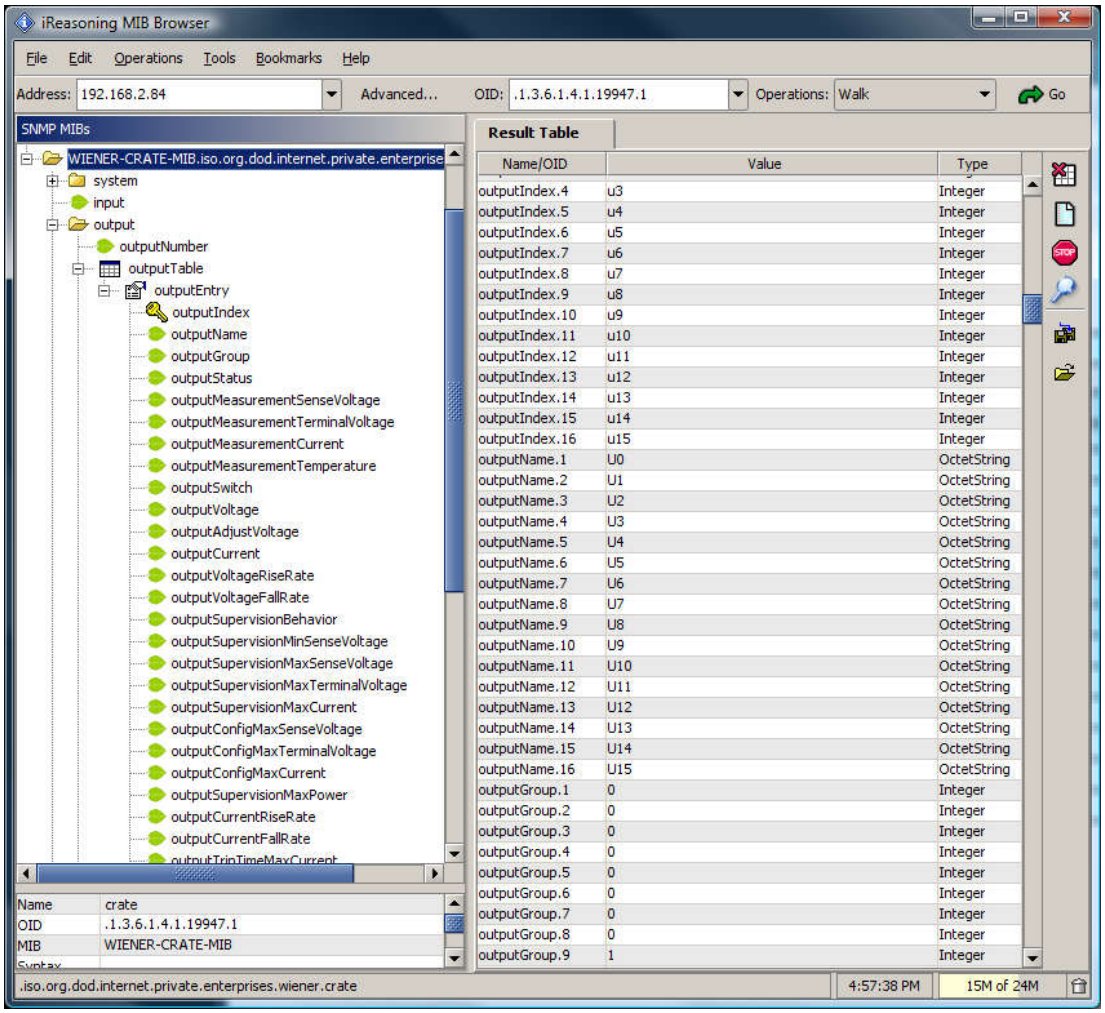
WIENER-CRATE-MIB::snmpCommunityName.guru = STRING: "seCrET"

snmpwalk -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.0.80 snmpCommunityName
Timeout: No Response from 192.168.0.80

snmpwalk -v 2c -m +WIENER-CRATE-MIB -c seCrET 192.168.0.80 snmpCommunityName
WIENER-CRATE-MIB::snmpCommunityName.public = STRING: "public"
WIENER-CRATE-MIB::snmpCommunityName.private = STRING: "private"
WIENER-CRATE-MIB::snmpCommunityName.admin = STRING: "admin"
WIENER-CRATE-MIB::snmpCommunityName.guru = STRING: "seCrET"

7.9 MIB Browser

There are several commercial or open source MIB-Browser programs available which can be used for SNMP communication. These provide often a simple GUI and allow SNMP calls. Following is a list of some free or open source MIB – browsers:
http://www.ireasoning.com/mibbrowser.shtml
http://www.serverscheck.com/mib_browser/
http://www.mibble.org/
http://www.ks-soft.net/hostmon.eng/mibbrowser/index.htm
http://www.tembria.com/products/snmpbrowser/index.html



7.10 A BASH Simple Script for SNMP

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
```

7.11 MPOD SNMP Parameter List (most common)

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	string
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	string
psFirmwareVersion	1	R	string
psSerialNumber	1	R	string
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

(see SNMP tree structure at end of manual for full structure)

7.12 LabView Control Program (NETSNMP)

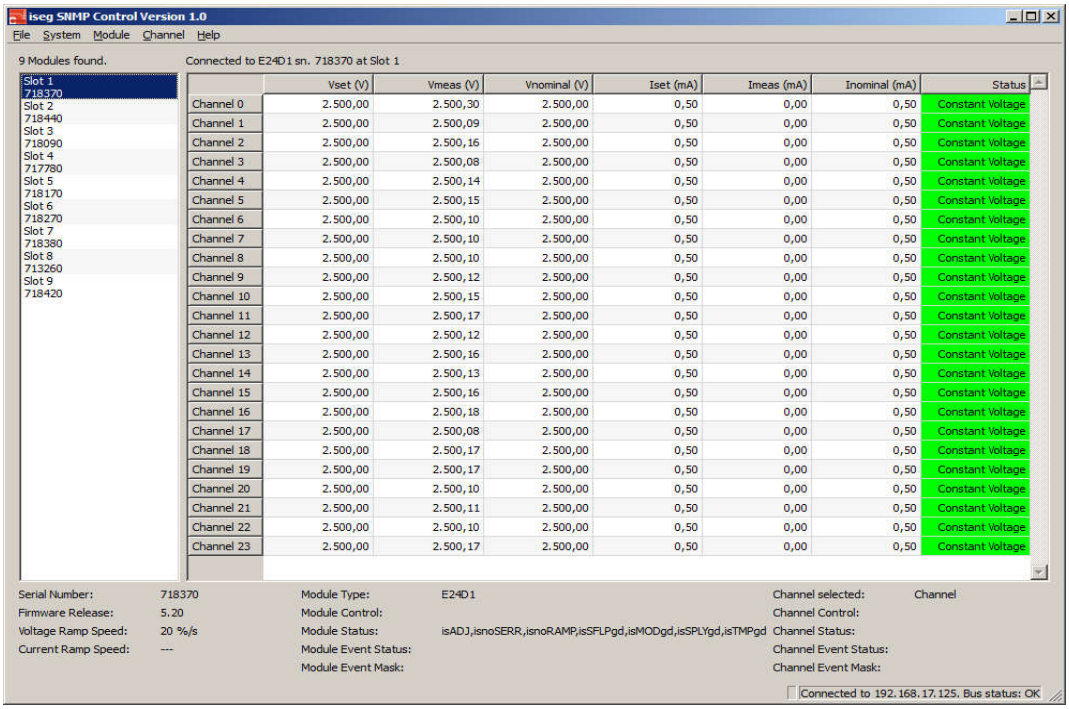
All LabView MPOD function VI's are using SNMP calls from the WIENER_SNMP_LV.DLL. This DLL requires the installation of NETSNMP and the WIENER –CRATE-MIB.txt file as described in Chapter 6.3!

The supplied LabView programs allow controlling both low and high voltage channels for small configurations of up to 10 MPOD modules. The program is provided as executable which will require the NI LV Run-time-engine. All source code is available on the CD-ROM. Please run these VI's with either LabView 8.5 or higher .

Example for LabView VI for 8 channel high voltage module

7.13 ISEG SNMP Control Program (NETSNMP)

The supplied iseg SNMP Control program allow controlling high voltage channels for configurations of up to 10 HV or LV modules plugged into the MPOD crate. The programs are provided as executable. All source code is available on the CD-ROM.



7.14 C++ programming (NetSNMP)

Using NetSNMP C++ programs can be easily written for monitoring and control of MPOD low / high voltage modules. For Windows all needed functions are provided by a dynamically loadable library WIENER_SNMP.DLL. This DLL requires NETSNMP and the WIENER –CRATE-MIB.txt file as described in chapter 6.3!
The following functions are provided in this library (for details see source code):

SnmpInit
SnmpCleanup
SnmpOpen
SnmpClose

getMainSwitch
setMainSwitch
getMainStatus
getVmeReset
setVmeReset

getOutputNumber
getOutputGroups
getOutputGroup
getChannelStatus
getOutputSenseMeasurement
getOutputTerminalMeasurement
getCurrentMeasurement
getTemperatureMeasurement
setChannelSwitch
getChannelSwitch
getOutputVoltage
setOutputVoltage
getOutputCurrent
setOutputCurrent
getOutputRiseRate
setOutputRiseRate
getOutputFallRate
setOutputFallRate
getOutputSupervisionBehavior
setOutputSupervisionBehavior
getOutputSupervisionMinSenseVoltage
setOutputSupervisionMinSenseVoltage
getOutputSupervisionMaxSenseVoltage
setOutputSupervisionMaxSenseVoltage
getOutputSupervisionMaxTerminalVoltage
setOutputSupervisionMaxTerminalVoltage
getOutputSupervisionMaxCurrent
setOutputSupervisionMaxCurrent
getOutputSupervisionMaxTemperature
getOutputConfigMaxSenseVoltage
getOutputConfigMaxTerminalVoltage
getOutputConfigMaxCurrent
getOutputConfigMaxPower

getSensorNumber
getSensorTemp
getSensorWarningTemperature
setSensorWarningTemperature
getSensorFailureTemperature
setSensorFailureTemperature

getPsOperatingTime

getFanOperatingTime
getFanAirTemperature
getFanSwitchOffDelay
setFanSwitchOffDelay
getFanNominalSpeed
setFanNominalSpeed
setFanNominalSpeed
getFanNumberOfFans
getFanSpeed

snmpSetDouble
snmpGetDouble
snmpSetInt
snmpGetInt

8 MPOD Crate

Powered chassis for multichannel low and high voltage modules

Construction	**8 Ux 19" crate**	max.10 modules, up to3 kW or 6KW output power / 3,6kW or 2x 3,6KW input power
	Slots:	10 + ½ (MPOD controller)
	Dimensions (w, h, d)	483 mm x 460 mm x 355 mm
	Weight:	31,5 kg

9 Primary Power Supply

The power supply provides all necessary supply voltages for the LV- and HV-Modules.

It is connected to the mains (World wide input 100..240V AC, 50..60 Hz).

- World wide input: 100..240V AC, 50..60 Hz, single phase
- Sinusoidal current input, up to 16A or 2x 16A, depending on the used modules

9.1 Power Box Data Sheet

3U box with max. 6 power modules.

Mains Input

Rated Input Voltage:		106 – 230 V AC, +/- 15% variation allowed
Rated Input Current:		16 A or (2x 16A)
Sinusoidal:	**CE**	CE EN 60555, IEC 555 pow. fact. 0,98 (230VAC)
Inrush current:		16 A, cold unit
Input protection:		An external fuse or circuit breaker has to be installed (16A max.)
RF rejection:		EN 55 022 Class B, Input and Output
Output protection overload: temperature		current limiting for booster circuits, 90°C cut off
Dimensions:		4U x 14 PU width acc. to IEC 60297, 450 mm deep
Weight:		4,7 kg
Operation temperature:		0....45°C without derating, storage: -30°C … + 85°C
M T B F electronics:		40°C ambient: ca. 100 000 h
integrated fan:		40°C ambient: ca. 65 000 h, 25° ambient >85000h

10 MPOD Low Voltage module MPV 8xx , MPV 4xx data sheet

- 8 channel low voltage module with floating outputs with individual return lines and sense lines
- Polarity configurable, outputs are insulated from each other and the chassis mainframe earth with 125V DC working voltage (Test voltage = 500VDC)
- 0.2% / 10K output voltage stability
- Voltage set / monitor: 15 bit resolution, +/-0.1% of full scale or better accuracy, measurement of both sense and terminal voltage
- Current limit set / monitor: 15 bit resolution, +/-0.5% of full scale or better accuracy
- Ramp-up / down programmable from 1 V/s to 500 V/s in 1 V/s steps.
- Output Voltage Ripple: < $10mV_{pp}$; $1mV_{Rms}$ with 350MHz Bandwidth

  < $5mV_{pp}$; $0.5mV_{Rms}$ with 100MHz Bandwidth

  < $3mV_{pp}$; $0.5mV_{Rms}$ with 20MHz Bandwidth

- Low conducted disturbance current (Funkstörstrom TÜV)
- Static Regulation: < 10mV
- Dynamic Regulation: <100mV with I = +/- 25% change and 70A/s

  recovery time < 5mS
- Dimensions: 6U x 40.64mm x 220mm
- Front Panel Indicators: tri-color LED's with on / off / failure for every channel
- Output Channels Connectors:
  2x 37-pin D-sub (outputs, returns, sense lines, chassis and interlock loop pair)

- Interlock Loop – optional
- Safety Loop – in connector PIN 18 and 37

Type	Channels	Voltage	I Max	Peak Power	V-Res	I-Res	Ripple
MPV 8008I	8	0 to 8V	10A	50W / ch.	0.5mV	0.5mA	<3mVpp
MPV 4008I	4	0 to 8V	20A	100W / ch.	0.5mV	0.5mA	<3mVpp
MPV 8016I	8	0 to 16V	5A	50W / ch.	1mV	0.25mA	<2mVpp
MPV 4016I	4	0 to 16V	10A	100W / ch.	1mV	0.25mA	<2mVpp
MPV 8030I	8	0 to 30V	2.5A	50W / ch.	2mV	0.12mA	<2mVpp
MPV 4030I	4	0 to 30V	5A	100W / ch.	2mV	0.12mA	<2mVpp
MPV 8060I	8	0 to 60V	1A	50W / ch.	4mV	0.06mA	<2mVpp
MPV 4060I	4	0 to 60V	2A	100W / ch.	4mV	0.06mA	<2mVpp
MPV 8120I	8	0 to 120V	100mA	50W / ch.	4mV	4 µA	<2mVpp

Regulation fast remote sense circuit (short sensed distance, sense connected to output at the MPOD module):

Static:	MVP 2-8 V	< 15 mV	(+/-100% load, +/- full mains range)
	MVP other voltages	< 0.05 %	(+/-100% load, +/- full DC input range)
Dynamic (0.5 m wire):	MVP 2-8 V	< 100 mV	(50 % - 75 % load change)
	other	< 0.7 %	(50 % - 75 % load change)
Recovery Time:	MVP 2-8V	1%: 0.2 ms 0.1%: 0.5 ms	(50 % - 75 % load change)
	MVP 5-16V, 7-24V	1%: 0.0 ms 0.1%: 1.0 ms	(50 % - 75 % load change)
	MVP 30-60V	1%: 0.5 ms 0.1%: 1.0 ms	(50 % - 75 % load change)
Conditions	Current slope <1000A/ms, 200uF per 1A parallel to load, fast regulation mode selected.		

Regulation slow remote sense circuit (long sensed distance):

Static:	MVP 2-8V/ 30-60V	< 15 mV	(+/-100% load, +/- full mains range)
	Other	< 0.05 %	(+/-100% load, +/- full mains range)
Dynamic:	Dynamic deviation depends on current slope resp. filter capacitors at load side only 30m cable to load, 0,3mF capacitance at load side, 1V drop at nominal load, 10% - 90 % load change with 3ms slope (50A output= 13,33A/ms) leads to less than 10% temporary output voltage deviation		
Recovery Time (40m wire, 5V at load side, U_{drop} < 2 V:	MVP 2-7V, 2-8V	10%: <15 ms 1%: <25 ms	(50 % - 75 % load change)
	Other	10%: <15 ms 1%: < 33 ms	(50 % - 75 % load change)

11 SNMP examples for MPOD and high voltage EHS/EDS module

```
/*****************************************************************************************************/
/*                                                                                                   */
/*  SNMP example for control of iseg Multi-Channel High Voltage Power Supply Modules in              */
/*  a W-IE-NE-R MPOD crate                                                                           */
/*                                                                                                   */
/*  snmpget -Oqv -v 2c -M $path -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputVoltage.u100     */
/*  This command will request the value from datapoint set voltage.                                  */
/*  snmpget: starts a SNMP request                                                                   */
/*  -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 WIENERCRATE-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                              */
/*  192.168.16.222: The IP address of the MPOD crate.                                                */
/*  outputVoltage.u100: The SNMP item to the data point set voltage of a module in the second        */
/*                    slot of the MPOD crate HV channel 0.                                           */
/*                                                                                                   */
/*  snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputVoltage.u100 F 60         */
/*  This command writes a floating point value to the datapoint set voltage.                         */
/*  snmpset: starts a SNMP write instruction                                                         */
/*  -c guru: This specifies the community for write accesses                                         */
/*  F 60: The F specifies the write value as a floating point formated value.                        */
/*        The 60 is the write value 60 Volt.                                                         */
/*                                                                                                   */
/*  snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputSwitch.u100 i 1             */
/*  This command write a switch on of the HV for one channel.                                        */
/*  outputSwitch.u100 i 1: Write of an integer formatted value to the item outputSwitch.             */
/*                    With that item it is possible to switch differnt functions for instance      */
/*                    set On(1).                                                                     */
/*****************************************************************************************************/

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputVoltage.u100
200.000000 V

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputVoltage.u100 F 60
60.000000 V

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputSwitch.u100 i 1
On

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputVoltage.u100
60.000000 V

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputMeasurementSenseVoltage.u100
60.104588 V

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputMeasurementSenseVoltage.u100
60.104713 V

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputMeasurementCurrent.u100
0.000001 A

snmpgetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputMeasurementCurrent.u100
0.000000735 A

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputSupervisionBehavior.u100
0

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputSupervisionBehavior.u100 i 64
64

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputSupervisionBehavior.u100
```

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputTripTimeMaxCurrent.u100
0 ms

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputTripTimeMaxCurrent.u100 i 3000
3000 ms /* delay of 3 sconds */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 " /* outputOn */

snmpgetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputMeasurementCurrent.u100
0.000000735 A

snmpsetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputCurrent.u100 F 0.0000007
0.000000700 A

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"04 08 " /*outputFailureMaxCurrent, outputRampDown */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"04 " /* outputFailureMaxCurrent */

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputSwitch.u100 i 10
clearEvents

snmpsetx -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputCurrent.u100 F 0.00001
0.000010000 A

snmpset -Oqv -v 2c -m +WIENER-CRATE-MIB -c guru 192.168.16.222 outputSwitch.u100 i 1
On

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 10 " /* outputOn, outputRampUp */

/* a load has been switched on channel 0 to bring them in state CC current limited */
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 20 " /* outputOn, outputCurrentLimited */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 20 " /* outputOn, outputCurrentLimited */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 20 " /* outputOn, outputCurrentLimited */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 20 " /* outputOn, outputCurrentLimited */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"80 20 " /* outputOn, outputCurrentLimited */

/* the delayed trip fuction pamps the voltage after 3 seconds to zero */
snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"04 08 " /* outputFailureMaxCurrent, outputRampDown */

snmpget -Oqv -v 2c -m +WIENER-CRATE-MIB -c public 192.168.16.222 outputStatus.u100
"04 08 " /* outputFailureMaxCurrent, outputRampDown */

12 WIENER SNMP Parameter structure

```
// GENERATED WITH
//    snmptranslate -w 120 -Tp WIENER-CRATE-MIB::crate > SnmpTree.txt
//
+--crate(1)
  +--system(1)
  |  +-- -RW- EnumVal   sysMainSwitch(1)
  |  |       Values: off(0), on(1)
  |  +-- -R-- BitString sysStatus(2)
  |  |       Values: mainOn(0), mainInhibit(1), localControlOnly(2), inputFailure(3), outputFailure(4),
  |  |               fantrayFailure(5), sensorFailure(6), vmeSysfail(7), plugAndPlayIncompatible(8), busReset(9),
  |  |               supplyDerating(10), supplyFailure(11), supplyDerating2(12), supplyFailure2(13)
  |  +-- -RW- EnumVal   sysVmeSysReset(3)
  |  |       Values: trigger(1)
  |  +-- -RW- INTEGER   sysHardwareReset(4)
  |  +-- -RW- EnumVal   sysFactoryDefaults(5)
  |  |       Values: off(0), on(1)
  |  +-- -RW- BitString sysConfigDoMeasurementCurrent(10)
  |  |       Values: ch0(0), ch1(1), ch2(2), ch3(3), ch4(4), ch5(5), ch6(6), ch7(7)
  |  +-- -RW- Integer32 sysOperatingTime(11)
  |  +-- -RW- Integer32 sysDebugMemory8(1024)
  |  |       Range: 0..255
  |  +-- -RW- Integer32 sysDebugMemory16(1025)
  |  |       Range: 0..65535
  |  +-- -RW- Integer32 sysDebugMemory32(1026)
  |  |       Range: -2147483648..2147483647
  |  +-- -RW- String    sysDebug(1027)
  |  |       Size: 520
  |  +-- -RW- String    sysDebugDisplay(1028)
  |  +-- -RW- String    sysDebugBoot(1029)
  |
  +--input(2)
  +--output(3)
  |  +-- -R-- Integer32 outputNumber(1)
  |  |       Range: 0..1999
  |  |
  |  +--outputTable(2)
  |  |  |
  |  |  +--outputEntry(1)
  |  |     |  Index: outputIndex
  |  |     |
  |  |     +-- ---- EnumVal   outputIndex(1)
  |  |     |       Values: u0(1), u1(2), u2(3), u3(4), u4(5), u5(6), u6(7), u7(8), u8(9), u9(10), u10(11), u11(12),
  |  |     +-- -R-- String    outputName(2)
  |  |     |       Textual Convention: DisplayString
  |  |     |       Size: 1..4
  |  |     +-- -RW- Integer32 outputGroup(3)
  |  |     |       Range: 1..63
  |  |     +-- -R-- BitString outputStatus(4)
  |  |     |       Values: outputOn(0), outputInhibit(1), outputFailureMinSenseVoltage(2),
  |  |     |               outputFailureMaxSenseVoltage(3), outputFailureMaxTerminalVoltage(4),
  |  |     |               outputFailureMaxCurrent(5), outputFailureMaxTemperature(6), outputFailureMaxPower(7),
  |  |     |               outputFailureTimeout(9), outputCurrentLimited(10), outputRampUp(11), outputRampDown(12),
  |  |     |               outputEnableKill(13), outputEmergencyOff(14), outputAdjusting(15),
  |  |     |               outputConstantVoltage(16), outputLowCurrentRange(17), outputCurrentBoundsExceeded(18),
  |  |     |               outputFailureCurrentLimit(19)
  |  |     +-- -R-- Opaque    outputMeasurementSenseVoltage(5)
  |  |     |       Textual Convention: Float
  |  |     |       Size:
  |  |     +-- -R-- Opaque    outputMeasurementTerminalVoltage(6)
  |  |     |       Textual Convention: Float
  |  |     |       Size:
  |  |     +-- -R-- Opaque    outputMeasurementCurrent(7)
  |  |     |       Textual Convention: Float
```

```
| |   |       Size:
| |   +-- -R-- EnumVal   outputMeasurementTemperature(8)
| |   |       Values: ok(-128), failure(127)
| |   +-- -RW- EnumVal   outputSwitch(9)
| |   |       Values: off(0), on(1), resetEmergencyOff(2), setEmergencyOff(3), clearEvents(10),
| |   |             setVoltageRippleMeasurementOff(20), setVoltageMeasurementOn(21),
| |   |             setRippleMeasurementOn(22), setVoltageRippleMeasurementOn(23)
| |   +-- -RW- Opaque    outputVoltage(10)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Integer32 outputAdjustVoltage(11)
| |   |       Range: -128..127
| |   +-- -RW- Opaque    outputCurrent(12)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputVoltageRiseRate(13)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputVoltageFallRate(14)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Integer32 outputSupervisionBehavior(15)
| |   |       Range: 0..65535
| |   +-- -RW- Opaque    outputSupervisionMinSenseVoltage(16)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputSupervisionMaxSenseVoltage(17)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputSupervisionMaxTerminalVoltage(18)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputSupervisionMaxCurrent(19)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Integer32 outputSupervisionMaxTemperature(20)
| |   +-- -RW- Opaque    outputConfigMaxSenseVoltage(21)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputConfigMaxTerminalVoltage(22)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputConfigMaxCurrent(23)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputSupervisionMaxPower(24)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputCurrentRiseRate(25)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputCurrentFallRate(26)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- INTEGER   outputTripTimeMaxCurrent(27)
| |   |       Range: 0..4000
| |   +-- -R-- Opaque    outputHardwareLimitVoltage(28)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -R-- Opaque    outputHardwareLimitCurrent(29)
| |   |       Textual Convention: Float
| |   |       Size:
| |   +-- -RW- Opaque    outputConfigGainSenseVoltage(30)
| |   |       Textual Convention: Float
```

```
| |    |       Size:
| |    +-- -RW- Opaque    outputConfigOffsetSenseVoltage(31)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- Opaque    outputConfigGainTerminalVoltage(32)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- Opaque    outputConfigOffsetTerminalVoltage(33)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- Opaque    outputConfigGainCurrent(34)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- Opaque    outputConfigOffsetCurrent(35)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- Integer32 outputUserConfig(37)
| |    |       Range: 0..31
| |    +-- -RW- EnumVal   outputRegulationMode(38)
| |    |       Values: fast(0), moderate(1), slow(2)
| |    +-- -RW- Integer32 outputConfigMaxTemperature(39)
| |    +-- -RW- Opaque    outputResistance(40)
| |    |       Textual Convention: Float
| |    |       Size:
| |    +-- -RW- String    outputConfigDataS(1024)
| |    +-- -RW- String    outputConfigDataU(1025)
| |
| +-- -R-- Integer32 groupsNumber(3)
| |       Range: 1..1999
| |
| +--groupsTable(4)
| | |
| |  +--groupsEntry(1)
| |    |  Index: groupsIndex
| |    |
| |    +-- ---- Integer32 groupsIndex(1)
| |    |       Range: 0..1999
| |    +-- -RW- EnumVal   groupsSwitch(9)
| |            Values: undefined(-1), off(0), on(1), resetEmergencyOff(2), setEmergencyOff(3), disableKill(4),
| |                  enableKill(5), disableAdjust(6), enableAdjust(7), clearEvents(10)
| |
| +-- -R-- Integer32 moduleNumber(5)
| |       Range: 1..10
| |
| +--moduleTable(6)
|    |
|    +--moduleEntry(1)
|       |  Index: moduleIndex
|       |
|       +-- ---- EnumVal   moduleIndex(1)
|       |       Values: ma0(1), ma1(2), ma2(3), ma3(4), ma4(5), ma5(6), ma6(7), ma7(8), ma8(9), ma9(10)
|       +-- -R-- String    moduleDescription(2)
|       |       Size: 0..39
|       +--moduleAuxiliaryMeasurementVoltage(3)
|       |  +-- -R-- Opaque    moduleAuxiliaryMeasurementVoltage0(1)
|       |  |       Textual Convention: Float
|       |  |       Size:
|       |  +-- -R-- Opaque    moduleAuxiliaryMeasurementVoltage1(2)
|       |          Textual Convention: Float
|       |          Size:
|       |
|       +-- -R-- Opaque    moduleHardwareLimitVoltage(4)
|       |       Textual Convention: Float
|       |       Size:
```

```
|       +-- -R-- Opaque    moduleHardwareLimitCurrent(5)
|       |       Textual Convention: Float
|       |       Size:
|       +-- -RW- Opaque    moduleRampSpeedVoltage(6)
|       |       Textual Convention: Float
|       |       Size:
|       +-- -RW- Opaque    moduleRampSpeedCurrent(7)
|       |       Textual Convention: Float
|       |       Size:
|       +-- -R-- BitString moduleStatus(8)
|       |       Values: moduleIsFineAdjustment(0), moduleIsLiveInsertion(2), moduleIsHighVoltageOn(3),
|       |               moduleNeedService(4), moduleHardwareLimitVoltageIsGood(5), moduleIsInputError(6),
|       |               moduleIsNoSumError(8), moduleIsNoRamp(9), moduleSafetyLoopIsGood(10),
|       |               moduleIsEventActive(11), moduleIsGood(12), moduleSupplyIsGood(13),
|       |               moduleTemperatureIsGood(14), moduleIsKillEnable(15)
|       +-- -R-- BitString moduleEventStatus(9)
|       |       Values: moduleEventPowerFail(0), moduleEventLiveInsertion(2), moduleEventService(4),
|       |               moduleHardwareLimitVoltageNotGood(5), moduleEventInputError(6),
|       |               moduleEventSafetyLoopNotGood(10), moduleEventSupplyNotGood(13),
|       |               moduleEventTemperatureNotGood(14)
|       +-- -R-- INTEGER   moduleEventChannelStatus(10)
|       +-- -RW- EnumVal   moduleDoClear(11)
|       |       Values: nothing(0), doClear(1)
|       +--moduleAuxiliaryMeasurementTemperature(12)
|         +-- -R-- Opaque    moduleAuxiliaryMeasurementTemperature0(1)
|         |       Textual Convention: Float
|         |       Size:
|         +-- -R-- Opaque    moduleAuxiliaryMeasurementTemperature1(2)
|         |       Textual Convention: Float
|         |       Size:
|         +-- -R-- Opaque    moduleAuxiliaryMeasurementTemperature2(3)
|         |       Textual Convention: Float
|         |       Size:
|         +-- -R-- Opaque    moduleAuxiliaryMeasurementTemperature3(4)
|                 Textual Convention: Float
|                 Size:
|
+--sensor(4)
|  +-- -R-- Integer32 sensorNumber(1)
|  |       Range: 0..8
|  |
|  +--sensorTable(2)
|     |
|     +--sensorEntry(1)
|       |  Index: sensorIndex
|       |
|       +-- ---- EnumVal   sensorIndex(1)
|       |       Values: temp1(1), temp2(2), temp3(3), temp4(4), temp5(5), temp6(6), temp7(7), temp8(8)
|       +-- -R-- Integer32 sensorTemperature(2)
|       |       Range: -128..127
|       +-- -RW- Integer32 sensorWarningThreshold(3)
|       |       Range: 0..127
|       +-- -RW- Integer32 sensorFailureThreshold(4)
|       |       Range: 0..127
|       +-- -RW- Integer32 sensorAlarmThreshold(6)
|       |       Range: 0..127
|       +-- -RW- String    sensorName(7)
|       |       Textual Convention: DisplayString
|       |       Size: 1..7
|       +-- -RW- String    sensorID(8)
|       |       Size: 8
|       +-- -R-- Integer32 sensorStatus(9)
|
+--communication(5)
```

```
| +--snmp(1)
| | |
| | +--snmpCommunityTable(1)
| | | |
| | | +--snmpCommunityEntry(1)
| | | |  | Index: snmpAccessRight
| | | |  |
| | | |  +-- ---- EnumVal   snmpAccessRight(1)
| | | |  |       Values: public(1), private(2), admin(3), guru(4)
| | | |  +-- -RW- String    snmpCommunityName(2)
| | | |           Size: 0..14
| | | |
| | | +-- -RW- Integer32 snmpPort(2)
| | | +-- -RW- Integer32 httpPort(3)
| | | +-- -RW- String    firmwareUpdate(10)
| | | |       Size: 0..30
| | | +-- -R-- IpAddr    ipDynamicAddress(11)
| | | +-- -RW- IpAddr    ipStaticAddress(12)
| | | +-- -RW- String    macAddress(13)
| | |         Size: 6
| | |
| | +--can(2)
| |    +-- -RW- Integer32 canBitRate(1)
| |    +-- -R-- String    canReceive(2)
| |    |       Size: 14
| |    +-- -RW- String    canTransmit(3)
| |    |       Size: 14
| |    +-- -R-- String    canReceiveHv(4)
| |    |       Size: 14
| |    +-- -RW- String    canTransmitHv(5)
| |            Size: 14
| |
| +--powersupply(6)
| | +-- -R-- String    psSerialNumber(2)
| | |       Textual Convention: DisplayString
| | |       Size: 0..255
| | +-- -RW- Integer32 psOperatingTime(3)
| | +-- -R-- Integer32 psAuxiliaryNumber(4)
| | |       Range: 0..8
| | |
| | +--psAuxiliaryTable(5)
| | | |
| | | +--psAuxiliaryEntry(1)
| | |    | Index: psAuxiliaryIndex
| | |    |
| | |    +-- ---- EnumVal   psAuxiliaryIndex(1)
| | |    |       Values: u0(1), u1(2), u2(3), u3(4), u4(5), u5(6), u6(7), u7(8)
| | |    +-- -R-- Opaque    psAuxiliaryMeasurementVoltage(3)
| | |    |       Textual Convention: Float
| | |    |       Size:
| | |    +-- -R-- Opaque    psAuxiliaryMeasurementCurrent(4)
| | |            Textual Convention: Float
| | |            Size:
| | |
| | +-- -RW- String    psDirectAccess(1024)
| |         Size: 1..14
| |
| +--fantray(7)
| | +-- -RW- String    fanSerialNumber(2)
| | |       Textual Convention: DisplayString
| | |       Size: 0..14
| | +-- -RW- Integer32 fanOperatingTime(3)
| | +-- -R-- Integer32 fanAirTemperature(4)
| | +-- -RW- Integer32 fanSwitchOffDelay(5)
```

```
| |       Range: 0..900
| +-- -RW- Integer32 fanNominalSpeed(6)
| +-- -RW- Integer32 fanNumberOfFans(7)
| |       Range: 0..12
| |
| +--fanSpeedTable(8)
| | |
| | +--fanSpeedEntry(1)
| |    | Index: fanNumber
| |    |
| |    +-- ---- Integer32 fanNumber(1)
| |    |       Range: 1..12
| |    +-- -R-- Integer32 fanSpeed(2)
| |
| +-- -RW- INTEGER   fanMaxSpeed(9)
| +-- -RW- INTEGER   fanMinSpeed(10)
| +-- -RW- Integer32 fanConfigMaxSpeed(11)
| +-- -RW- Integer32 fanConfigMinSpeed(12)
|
+--rack(8)
+--signal(9)
   +-- -R-- Integer32 numberOfAnalogInputs(1)
   |       Range: 0..8
   |
   +--analogInputTable(2)
   | |
   | +--analogInputEntry(1)
   |    | Index: analogInputIndex
   |    |
   |    +-- ---- Integer32 analogInputIndex(1)
   |    |       Range: 1..8
   |    +-- -R-- Opaque    analogMeasurementVoltage(2)
   |    |       Textual Convention: Float
   |    |       Size:
   |    +-- -R-- Opaque    analogMeasurementCurrent(3)
   |            Textual Convention: Float
   |            Size:
   |
   +-- -R-- BitString digitalInput(5)
   |       Values: d0(0), d1(1), d2(2), d3(3), d4(4), d5(5), d6(6), d7(7)
   +-- -R-- BitString digitalOutput(6)
           Values: d0(0), d1(1), d2(2), d3(3), d4(4), d5(5), d6(6), d7(7)
```

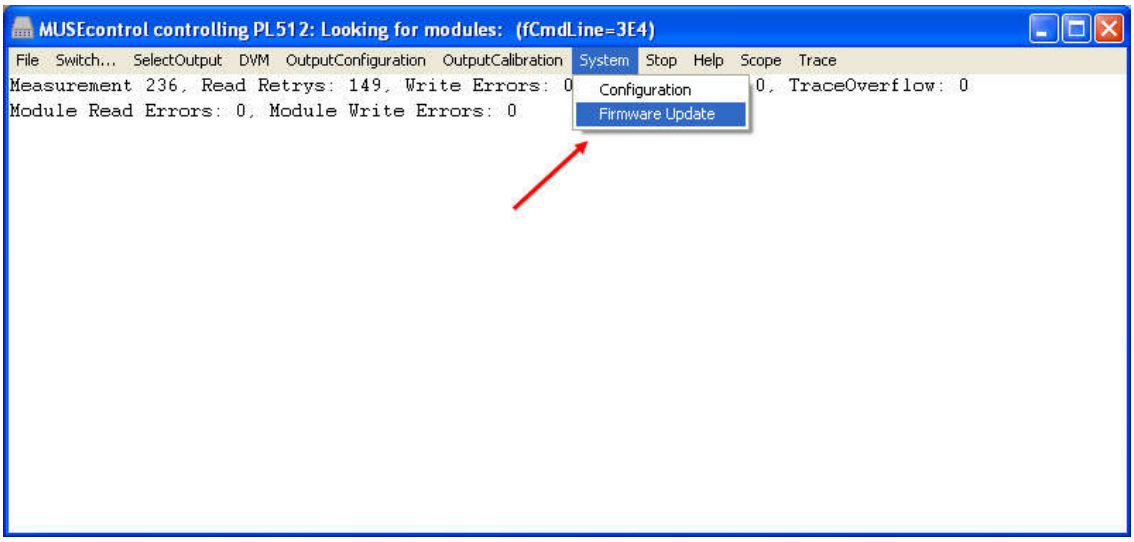
13 MPOD Firmware Update

For Bootloader from revision 1.5 and Firmware revision 2.*.0.15 and higher

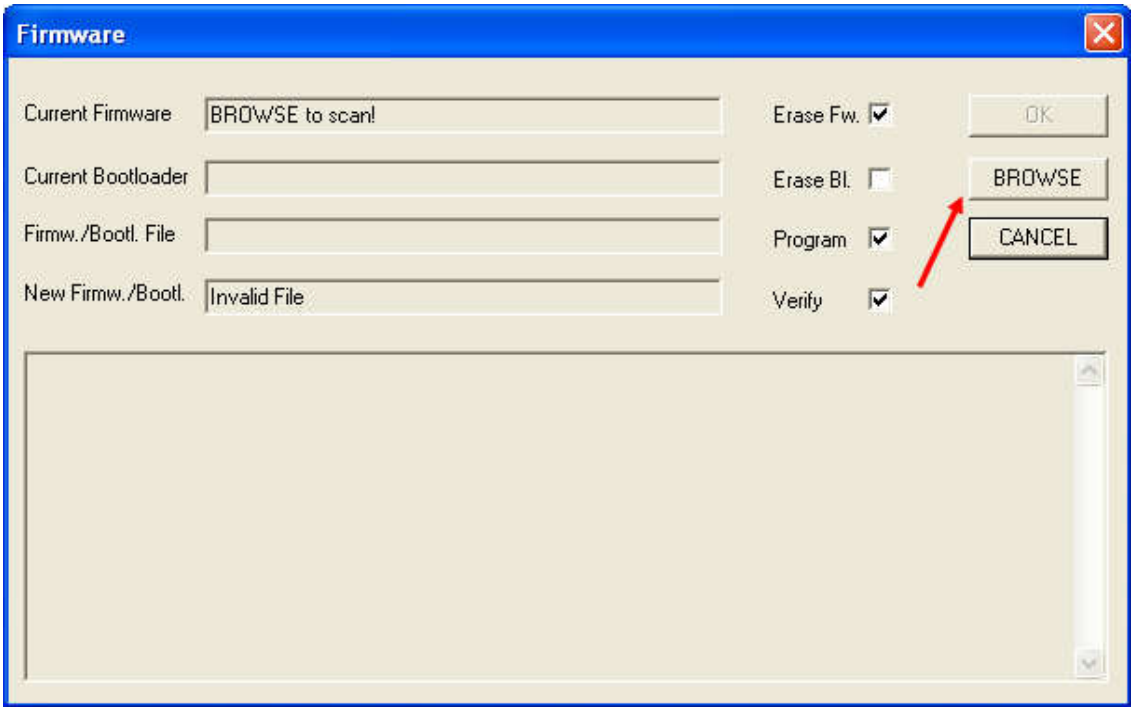
1) In addition to the latest firmware files you need the **MUSEcontrol** program version 2.0.910.0 or higher. All files can be download from the WIENER file server
http://file.wiener-d.com/software/MUSEcontrol/ and
http://file.wiener-d.com/firmware/MPOD/.

2) Connect the MPOD to the Computer via USB

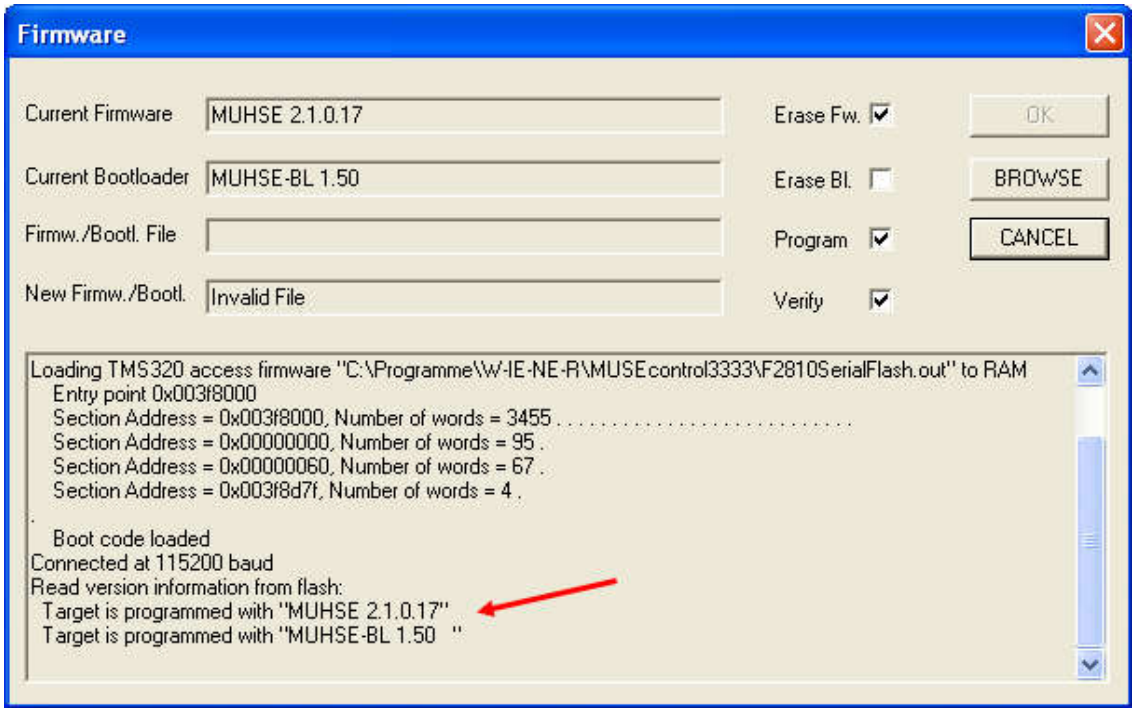
3) Start the MUSEcontrol program and select the tab “system”. In the opened pull down menu select the item “Firmware Update” to update the device via USB.



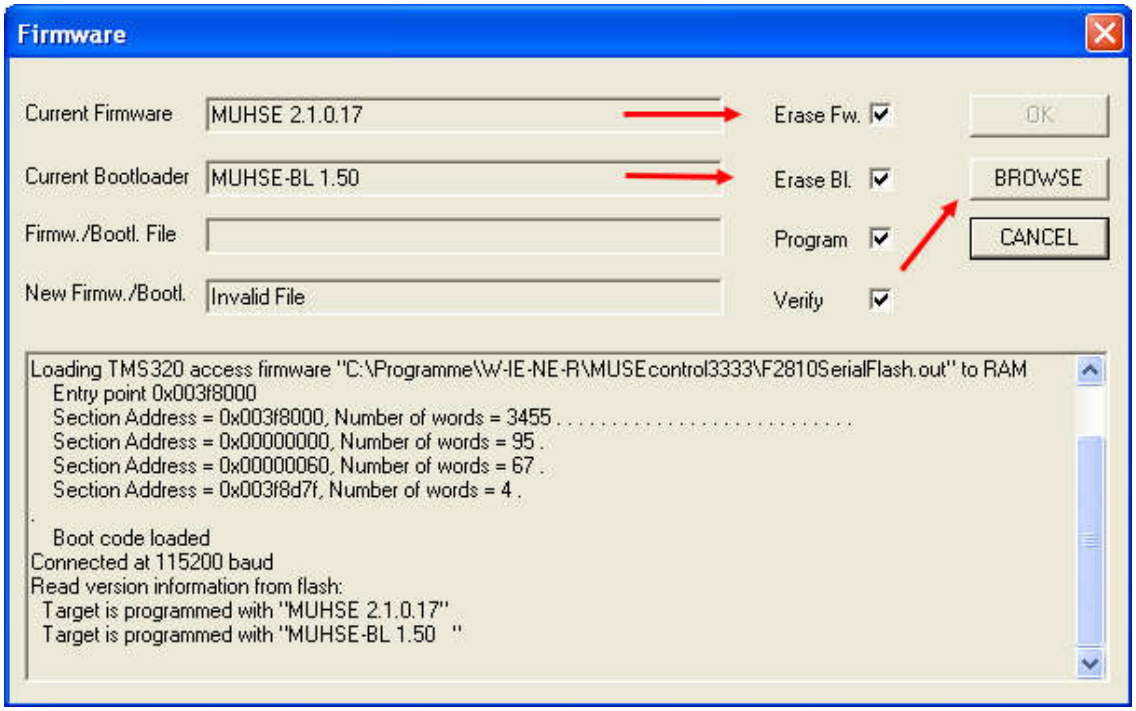
4) Hit the button “browse” to scan the device for current version of boot loader and firmware.



5) Check the version of the current firmware or boot loader. There are three options:



Option 1) Check “Erase Fw.” (erase firmware) and “Erase Bl.” (erase boot loader) if the current firmware is older than 2.*.0.15 or it is a firmware without boot loader. After that push the button “browse” to scan the flash. In some minutes select the new boot loader file in the automatically opened file menu. Press the button “Ok”. Now the whole flash
will be erased and the new boot loader will be installed.

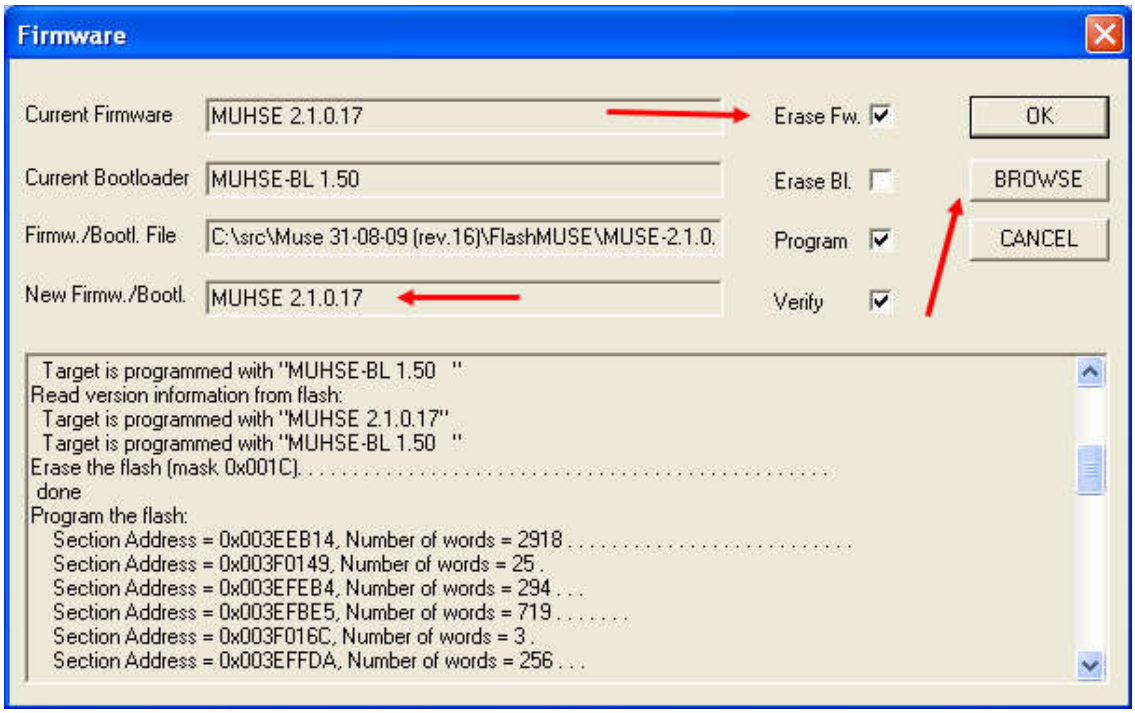


When the install process is done hit the button “cancel” to restart the system. It is recommended to close the MUSEcontrol program before restarting.
A window which indicates a communication problem appears. The reason for this is that only the bootloader without firmware is installed. Ignore this message by pushing the button “cancel”.

Also ignore the no modules message to hit the button “Ignorieren”.

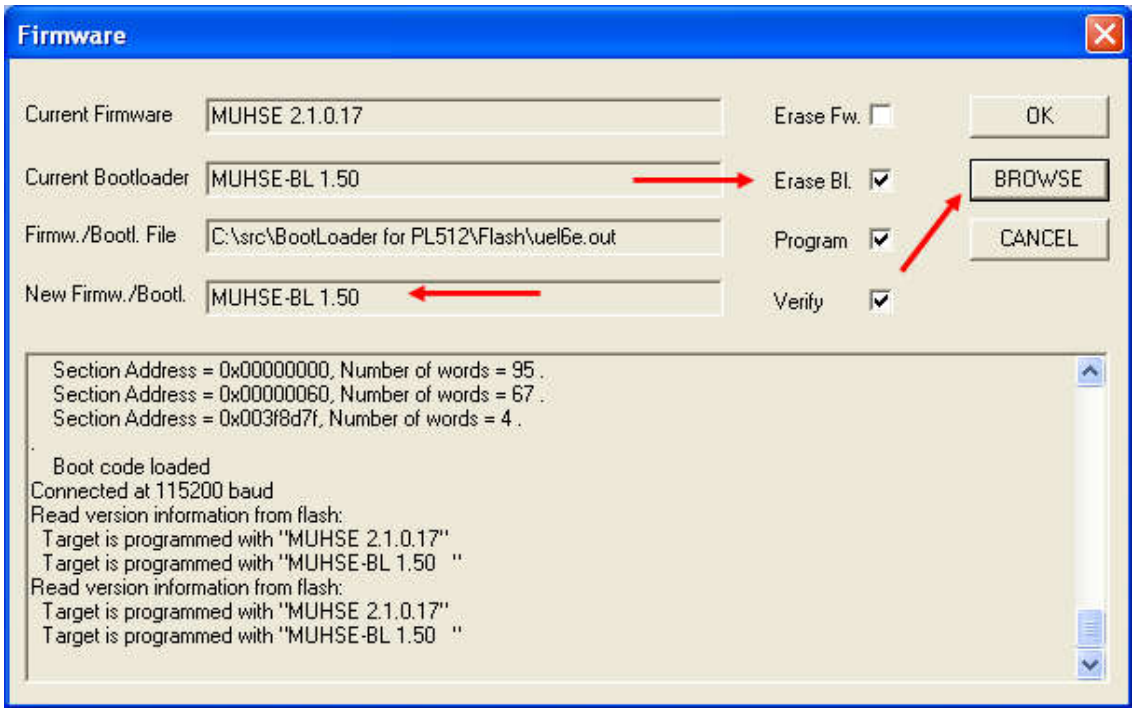
Follow the step 1 and 2. Execute the instructions of option 2.

Option 2) Check “Erase Fw.” (erase firmware) if there no current, legal firmware is available or a newer one should be installed. After that push the button “browse” to scan the flash. In some minutes select the new firmware file in the automatically opened file menu. Press the button“Ok”. Now the firmware partition in the flash will be
formatted and the new firmware will be installed.



When the install process is done hit the button “cancel” to restart the system. It is recommended to close the MUSEcontrol program before restarting.

Option 3) Check “Erase Bl.” (erase boot loader) if there an older boot loader (from version 1.5) and a newer one should be installed. If no boot loader is available chose option 1. After that push the button “browse” to scan the flash. In some minutes select the new boot loader file in the automatically opened file menu. Press the button“Ok”. Now the boot loader partition in the flash will be formatted and the new boot loader will be installed.

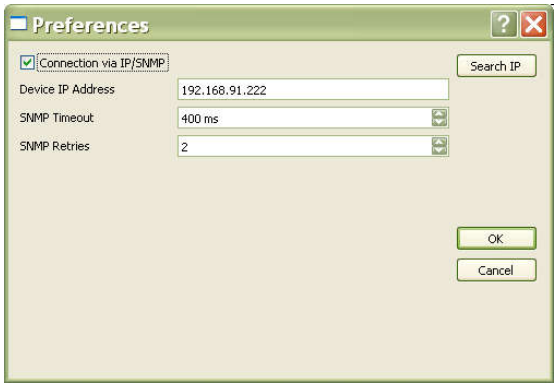


When the install process is done hit the button “cancel” to restart the system. It is recommended to close the MUSEcontrol program before restarting.

14 MPOD Display Firmware Update

MPOD display firmware update is possible with all displays using firmware Doom 1.0.1344.0 or above (see http://file.wiener-d.com/firmware/MPOD-Display)
The update is done via Ethernet connected to the MPOD controller with the special utillity **PIC32PL.exe** (http://file.wiener-d.com/software/PIC32BL)
Please install this software on your Windows PC start the program and perform the following procedure:

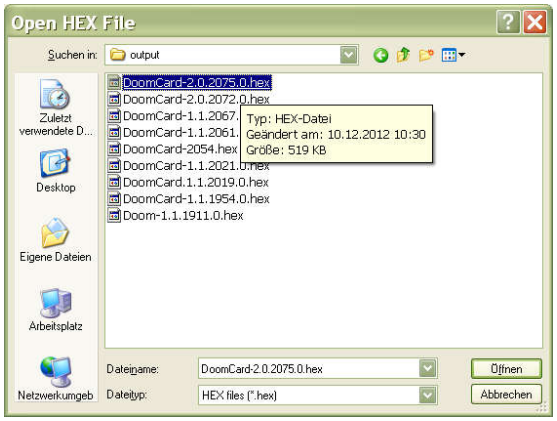
Select „**Extras → Preferences**“



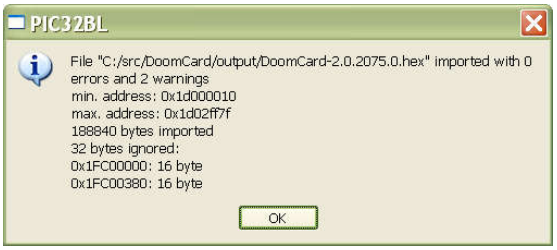
Enter MPOD IP address, and make sure the checkbox „Connect via IP/SNMP“ is checked. Then click „OK“.

Click „**Device → Connect**“ (green circle). The connection to the display firmware is established, and the icon changed to „Disconnect“ (red circle with x)

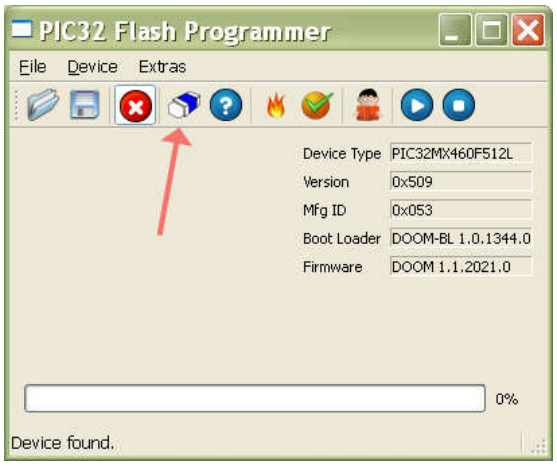
Click the „**Execute Boot Loader**“ icon at the right (blue circle with square). Normal operation of the display is stopped and boot loader operation is started.



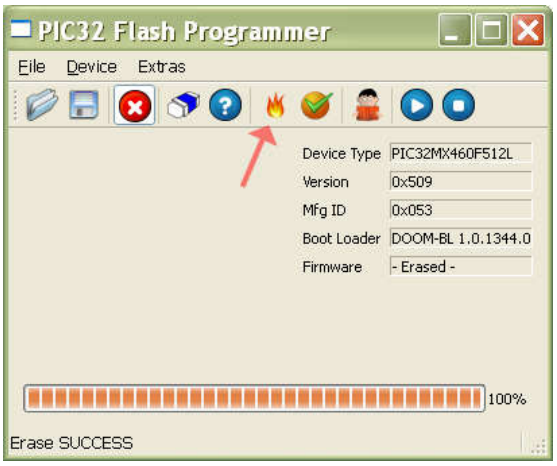
Now use „**File → Open**“ select firmware file



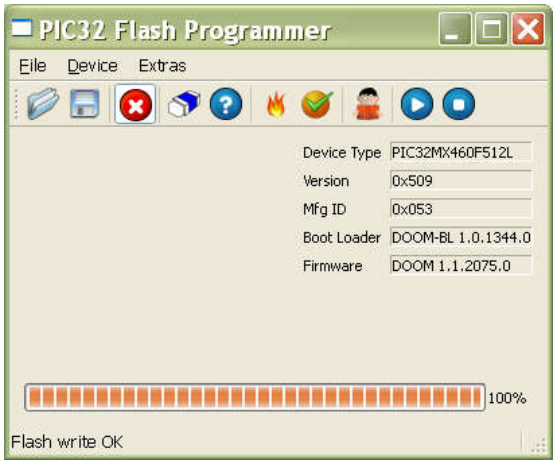
The the new firmware is read from disk. The 2 warnings (ignored data) are correct.



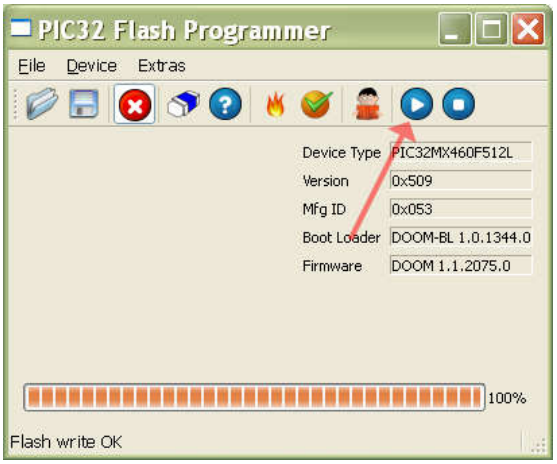
Click the „**Erase**“ icon to erase the previous firmware.



Click „**Program**“ to program the new firmware.



A verify is done automatically.



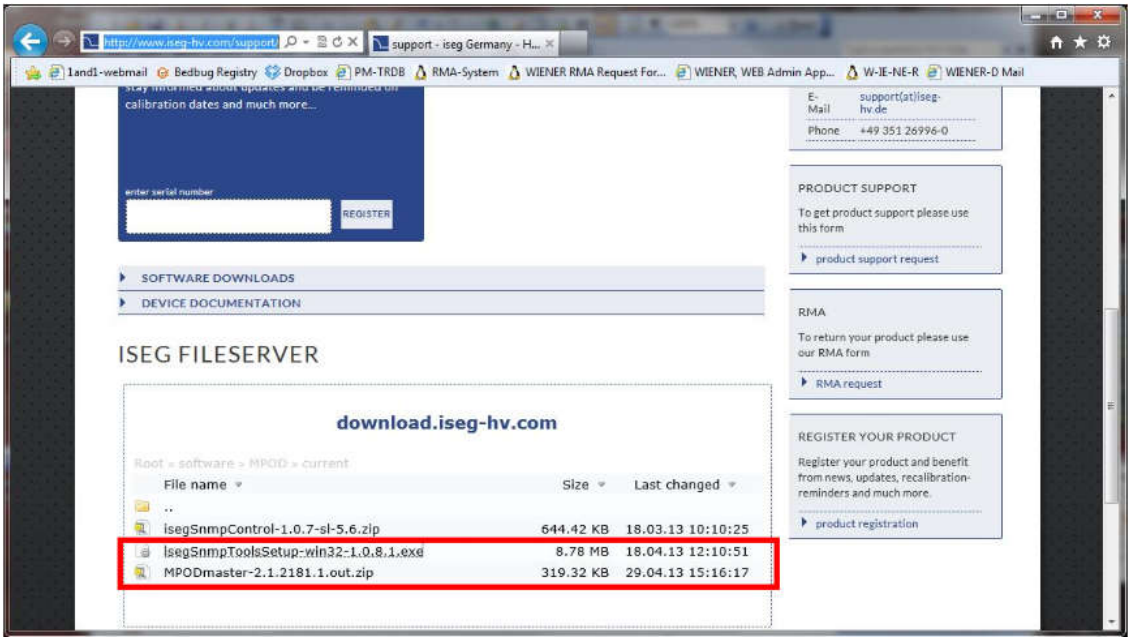
Now click the „**Run new firmware**“ icon (blue circle with triangle) to leave the boot loader and execute the new firmware.

15 ISEG HV Module Firmware Update vias Ethernet / SNMP

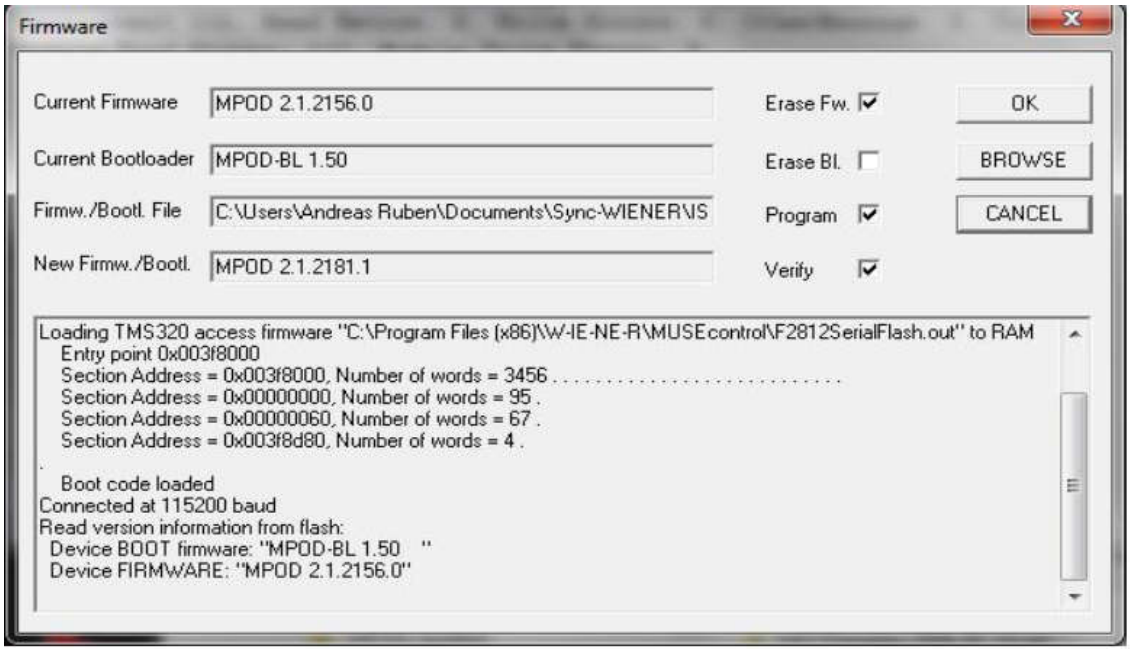
Download ISEG SNMP tools and latest firmware from ISEG WEB-Site:

http://www.iseg-hv.com/support/

The firmware may have to be requested by providing HV module name / part number and serial number



2. Perform MPOD firmware upgrade to MPODMaster 2.1.2181.1 or higher using MUSEcontrol and the USB connection (see instructions in MPOD manual)



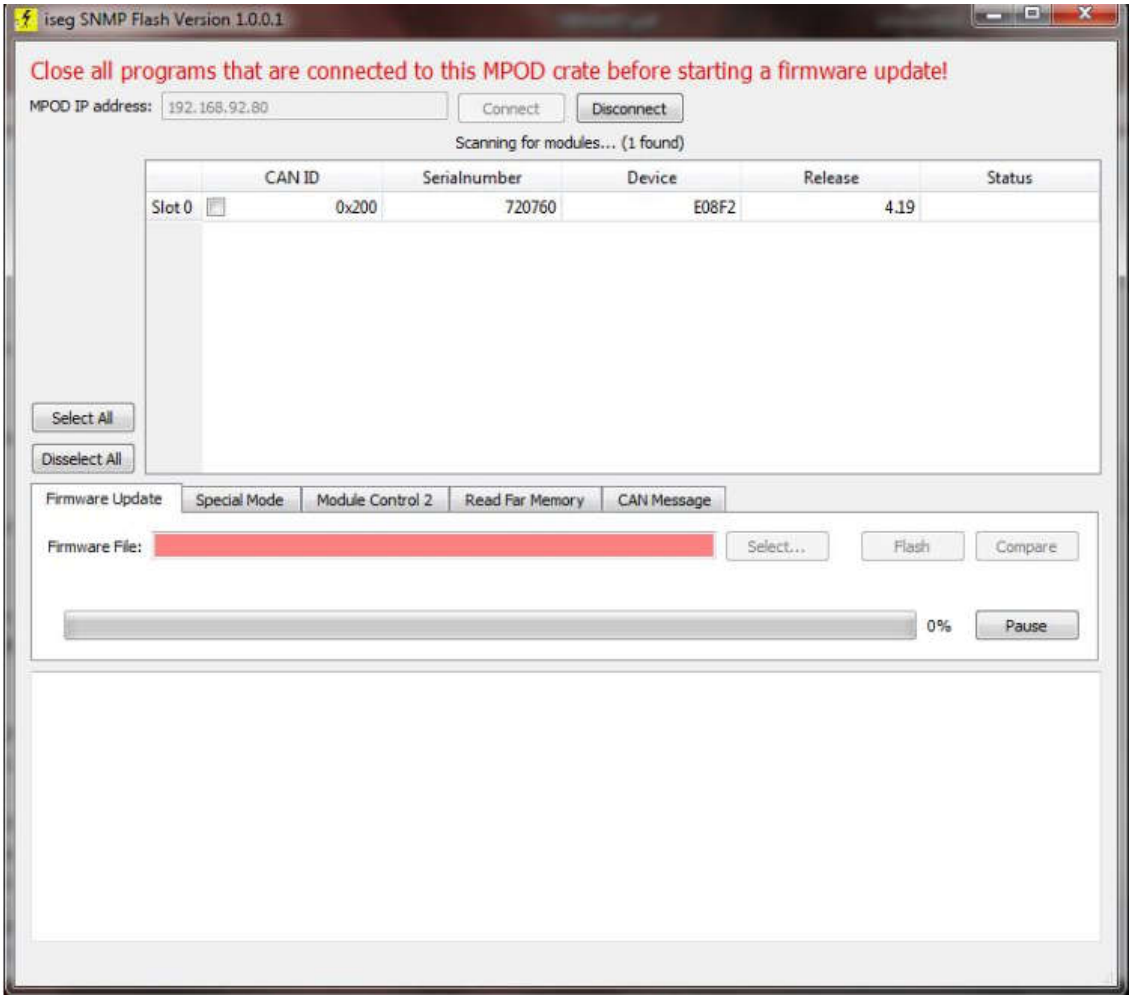
3. Run isegSnmpToolsSetup-win32-1.0.8.1.exe to install the ISEG software.
Remove all modules from the MPOD except the one you want to update (it's possible to update multiple modules sequentially, but it is saver to start with only one first)

4. Close all programs that connect to the MPOD

5. Start **isegSnmpFlash.exe**

6. Please insert the correct MPOD IP address and click connect

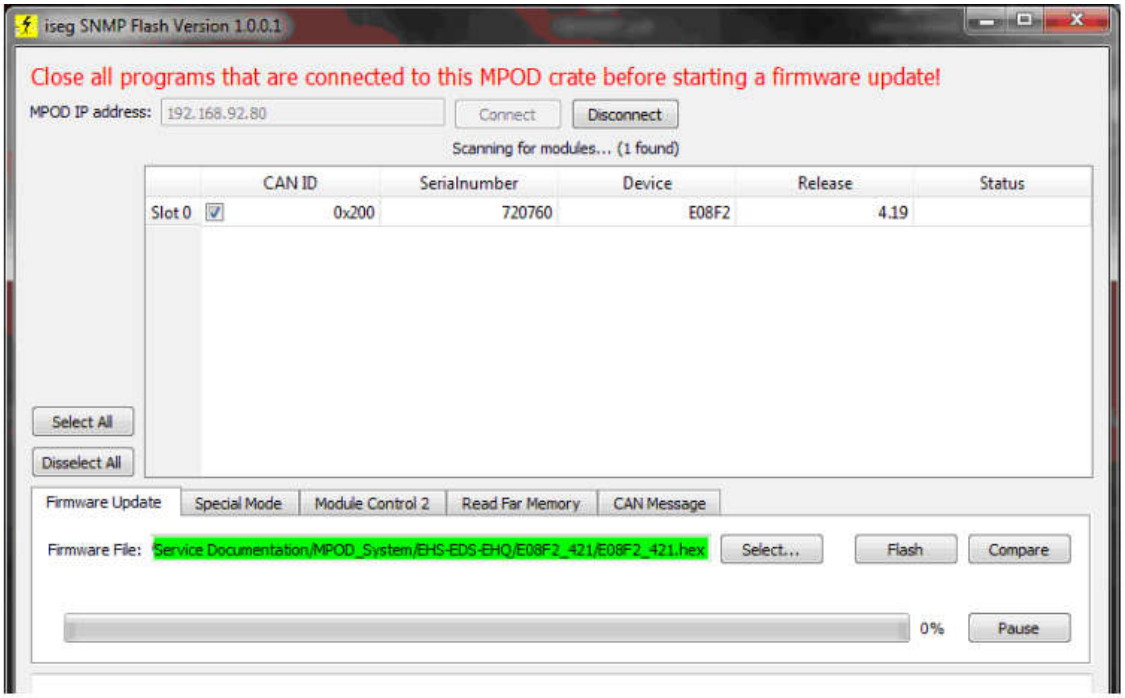
7. A list of modules in this MPOD appears (in this case, only one)



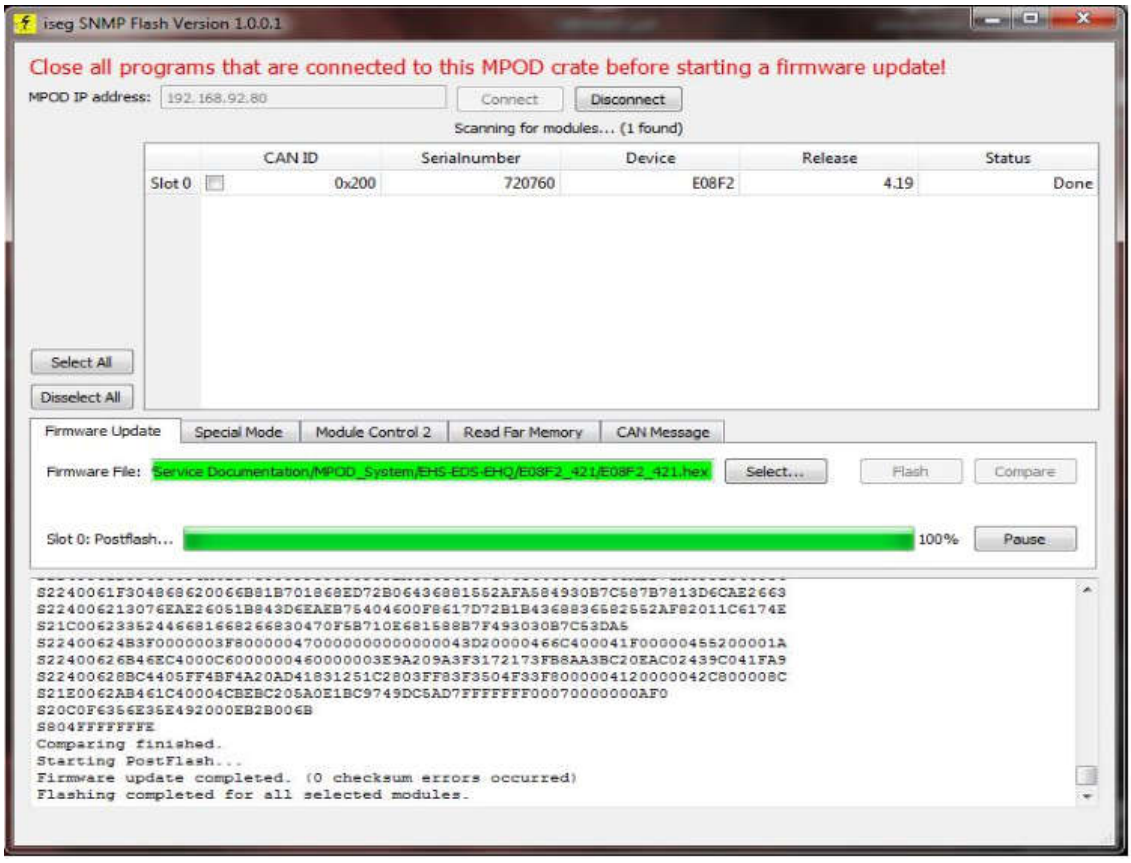
8. Check the box in the column CAN ID to flash/firmware upgrade this module

9. If the text field with the firmware name appears red, select the

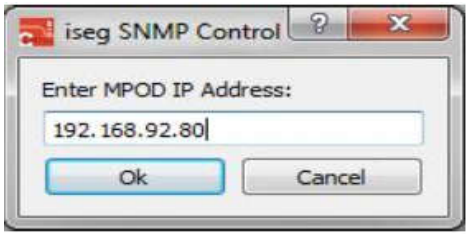
HEX file with "Select..." either E08F2_421.hex (or other recommended firmware file)

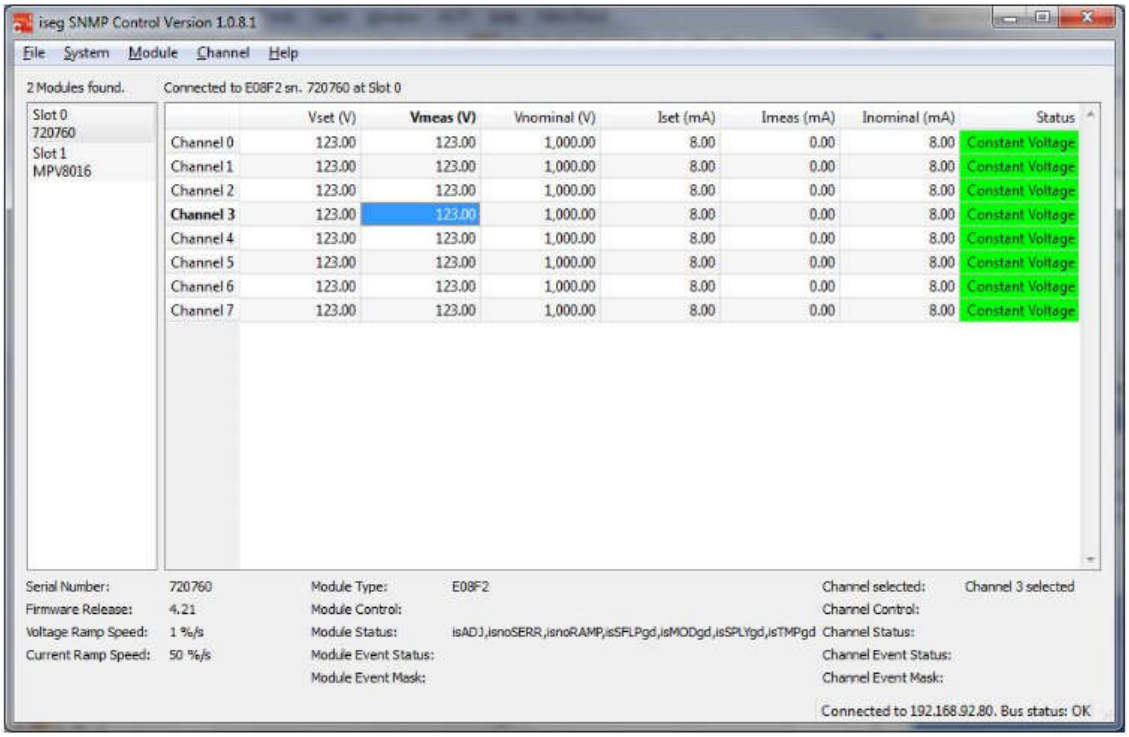


10. Click Flash. The update consists of three steps: Flash, Compare and Postflash. After Postflash, the Table shows "Done" in the status column.



11. You can now close the program, re-power the MPOD and control it again with iseg SNMP Control.





If anything goes wrong, e.g. the update stops and the progress bar is not moving for 2 minutes or more, you can close the program, re-power the MPOD and try again.

16 Instruction to change the Bitrate

Instruction to realize the change of the bitrate of the HV Module

The default setting for HV Modules with WIENER MPOD setup are 125kbit/s , this instruction describes how to set to 250KB/s.

Instruction to realize the change of the bitrate of the Controller

The default setting for all WIENER Controller are 125kbit/s , this instruction describes how to set to 250KB/s.

Hardware: tested with Peak CanBus_USB Dongle, Mpod Crate , PC Windows

Firmware: MPODmaster-2.1.3496.0 ; MPODslave-1.10 (is required)

Software:
MuseControl: http://file.wiener-d.com/software/MUSEcontrol/MUSEcontrolInstall-2.1.3505.0.exe

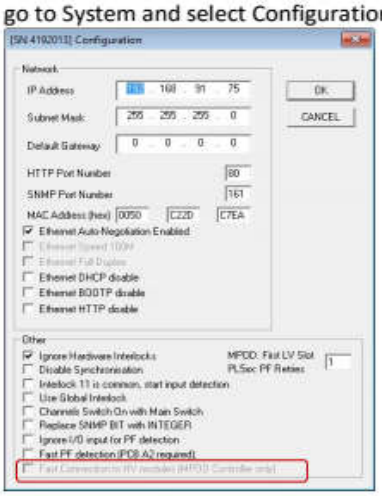
Please Install all needed Software !

1.

Connect PC to Mpod Controller per USB,

Start Muse Control

go to System and select Configuration



Set the checkbox on" Fast Connection to HV modules"
Confirm and restart the Mpod Crate.

! Now you can only use iseg HV Modules with 250kb/s !

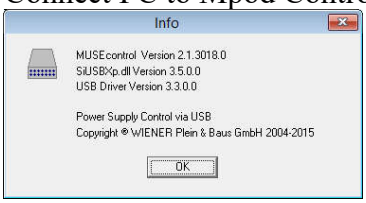
Hardware: tested with Peak CanBus_USB Dongle, Mpod Crate , PC Windows,

Firmware: MPODmaster-2.1.3496.0 ; MPODslave-1.10 (is required);

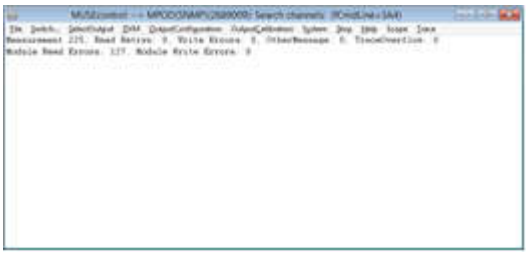
Software:
MuseControl: http://file.wiener-d.com/software/MUSEcontrol/MUSEcontrolInstall-2.1.3505.0.exe

IsegCANHVControl:
http://download.iseg-hv.com/software/isegCANControl/current/isegCanTerminal.zip
included Peak driver (use only the driver from iseg because it is modified),
PcanView http://www.peak-system.com/fileadmin/media/files/pcanview.zip
Please Install all needed Software !

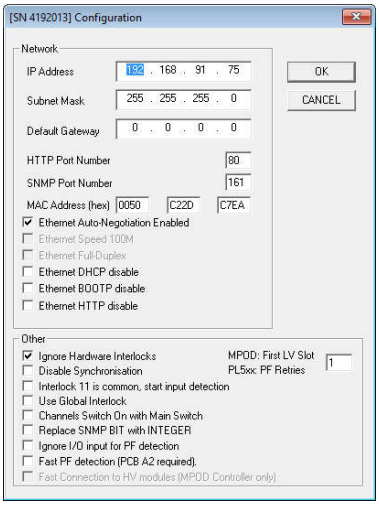
1.
Connect PC to Mpod Controller per USB,



Start Muse Control

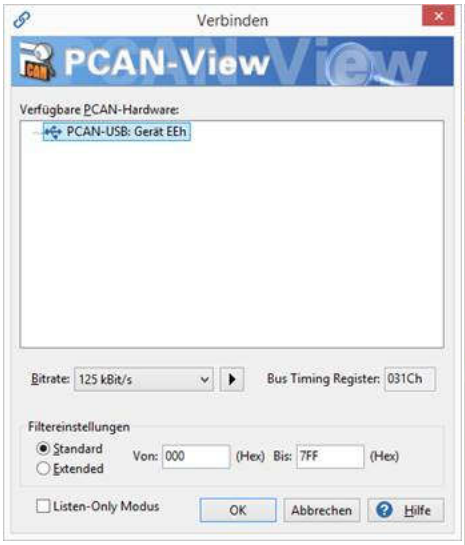


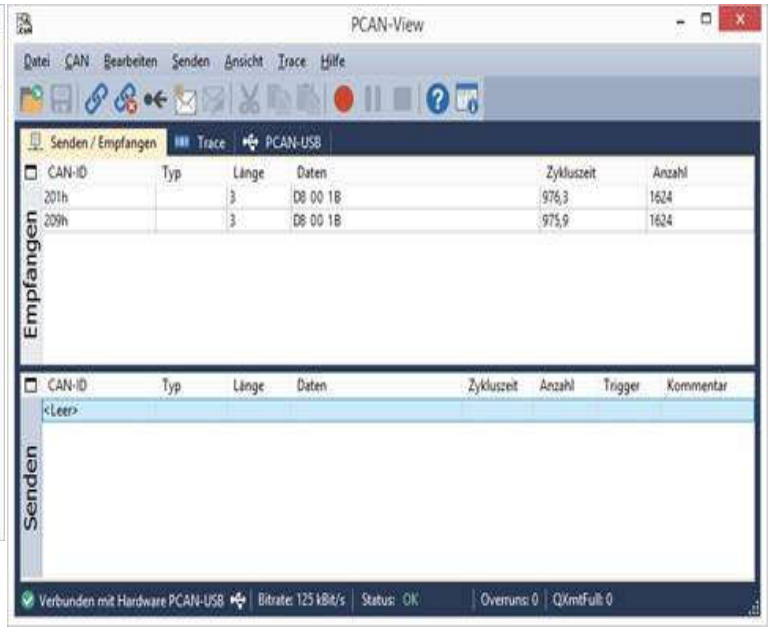
go to System and select Configuration

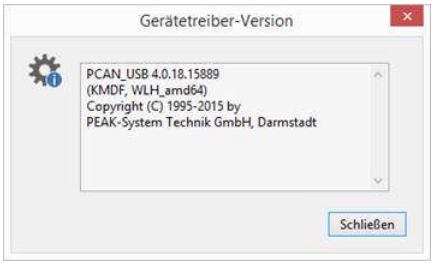


set the checkbox “disable synchronization”
Confirm and restart the Mpod Crate.

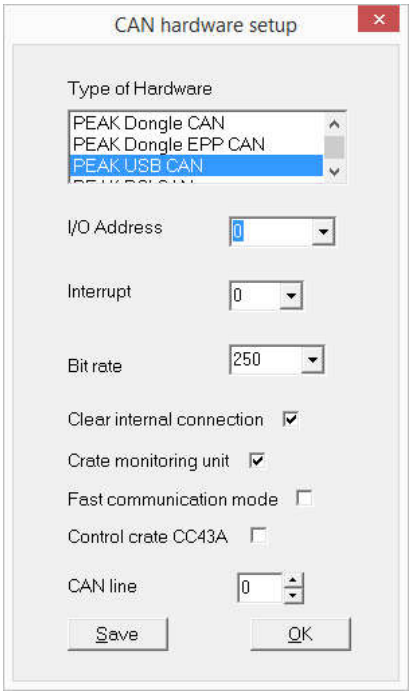
2.
Connect Mpod (CAN port)controller to PC (USB port)via CAN bus dongle.
The connection test with PCAN View of HV module:

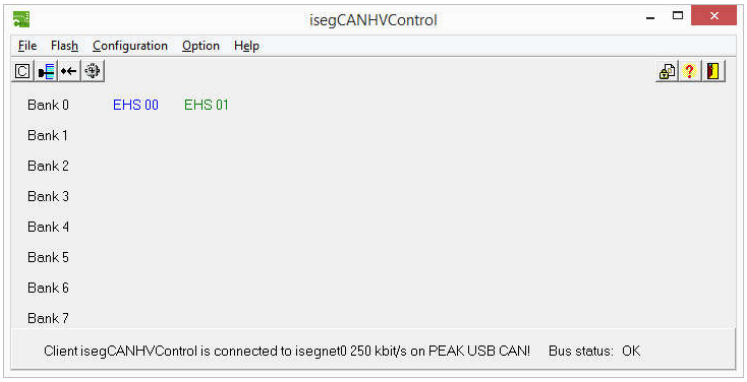




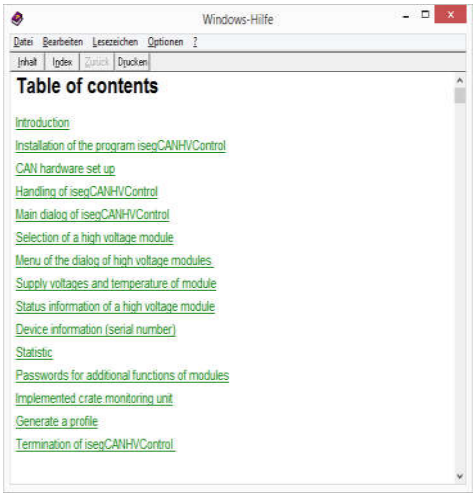


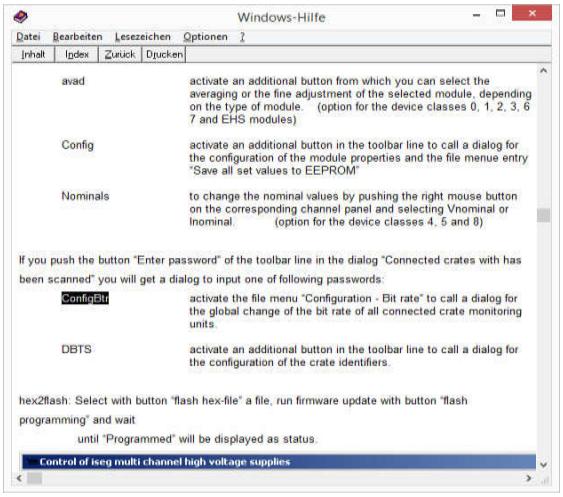
Open iseg Can Control,
Select Peak USB CAN and select the current bit rate (HV module)





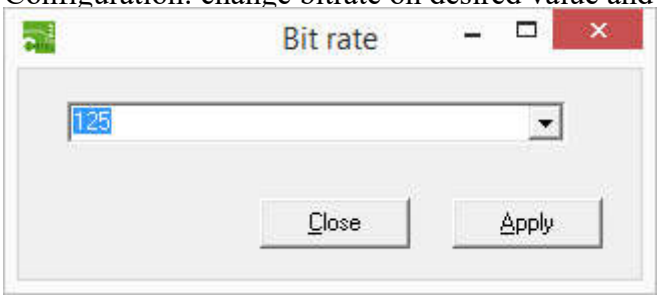
please copy corresponding password





and enter under Option Password.

Configuration: change bitrate on desired value and confirm



Now close IsegCanHVcontrol , open Muse Control and disable „Disable Synchronisation" (as point 1.)

Restart the Mpod Crate. Ready!