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Spezialelektronik GmbH

NHS devices with USB and CAN Interface

An Introduction to available SCPI Instruction Sets

Note

The information in this manual is subject to change without notice. We take no responsibility for any error in the document. We reserve the right to make changes in the product design without reservation and without notification to the users.

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1 General information

The NHS devices are High Voltage Power Supplies, available in different voltage ranges with up to 6 High Voltage (HV) channels. Available interfaces are USB to RS-232 Converter (FTDI) on the front panel which uses the iseg SCPI command set described later in this manual. Furthermore, a CAN interface is located at the front panel as well. The CAN EDCP / DCP command list is described in the manual EDCP_MULTI_CHANNEL_CAN.PDF.

To use the USB interface it is necessary to install the corresponding FTDI USB driver files. The installation is described in chapter 2.

A higher application layer such as the programs iseg Terminal (chapter 8), iseg SCPI Control (chapter 9), iseg CANHV Control or the iseg OPC Server allows to control the NHS device with its HV channels more convenient.

2 USB interface driver installation

The USB interface is realized with a female USB-B connector at the device front panel. Internal, the USB is implemented with an USB serial converter FTDI FT232R. For this converter a driver installation is needed.

2.1 Windows USB driver installation

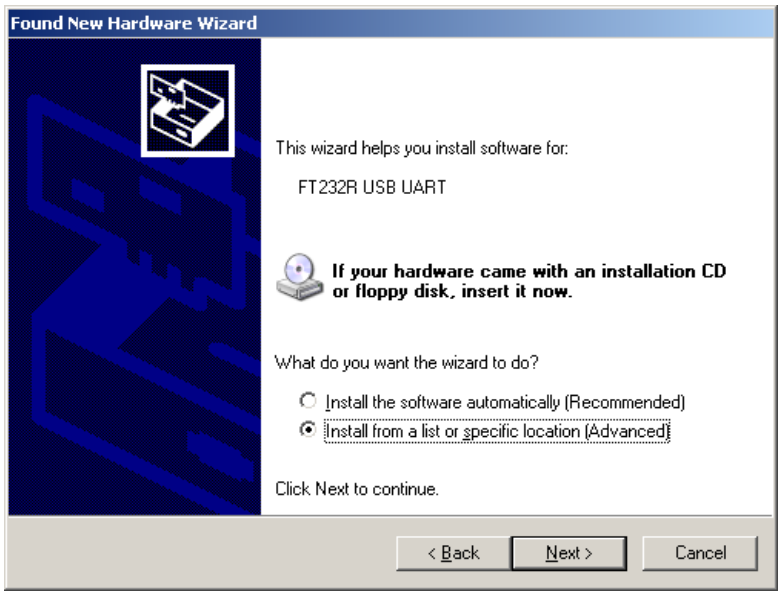
The FTDI VCP driver (Virtual COM Port) can be downloaded from

http://download.iseg-hv.com → Software → Tools → "FTDI USB-Serial Driver Windows 2.xx.zip"

The following steps are necessary for installation:

1. Extract the FTDI driver Zip-File e.g. to C:\Temp\
2. Connect the HV device to the computer via USB
3. The Found new Hardware wizard appears.
   Please choose "No, not this time" in the first dialog and then click Next.

4. Choose "Install from a list or specific location" in the next dialog and then click Next:



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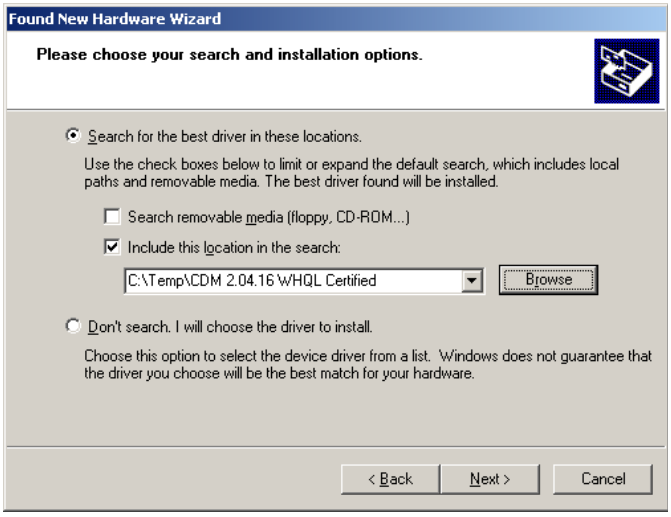
5. Please choose the directory you extracted the driver to and the click Next:



6. After some copying you get the final dialog:

It may be necessary to do the steps 3 to 6 again, before the device can be used (the first time, a bus driver is installed, the second time, the virtual COM port driver is installed).

To determine if the installation was successful, the Serial USB interface should be shown in the Device Manager.
Start the Device Manager with:

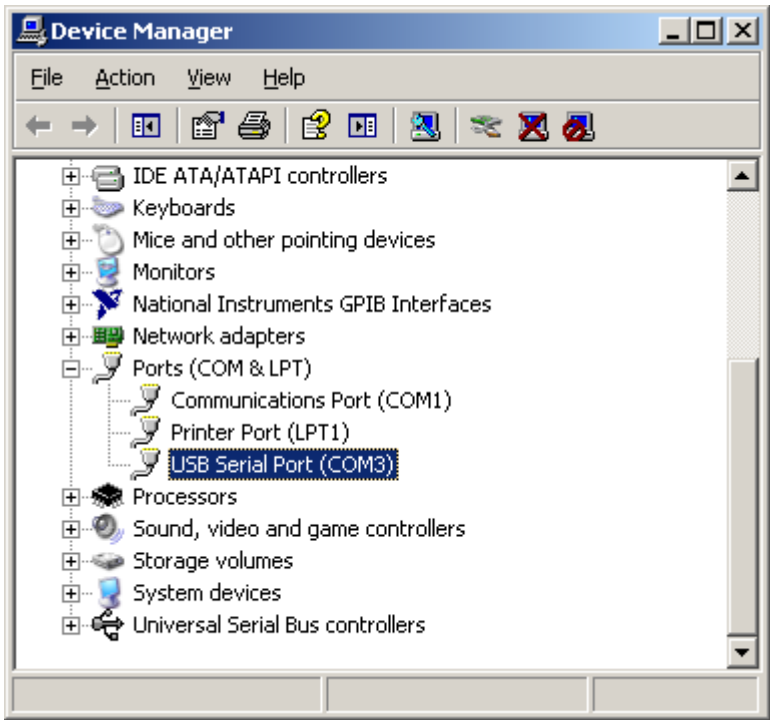
with Windows XP:

Start → Settings → Control Panel → System → Device Manager

or with Windows 7:

Start → Control Panel → Device Manager

All NHS devices with get an USB Serial Port assigned in section Ports (COM & LPT), in this case COM3:



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2.2 Linux USB driver installation

The driver is already included in Kernel series 2.6 and should be loaded automatically when connecting the device. The driver provides a virtual serial port /dev/ttyUSB0 that can be accessed with an Terminal program (e. g. CuteCom).

The following dmesg output shows how the device is recognized and the driver loaded:

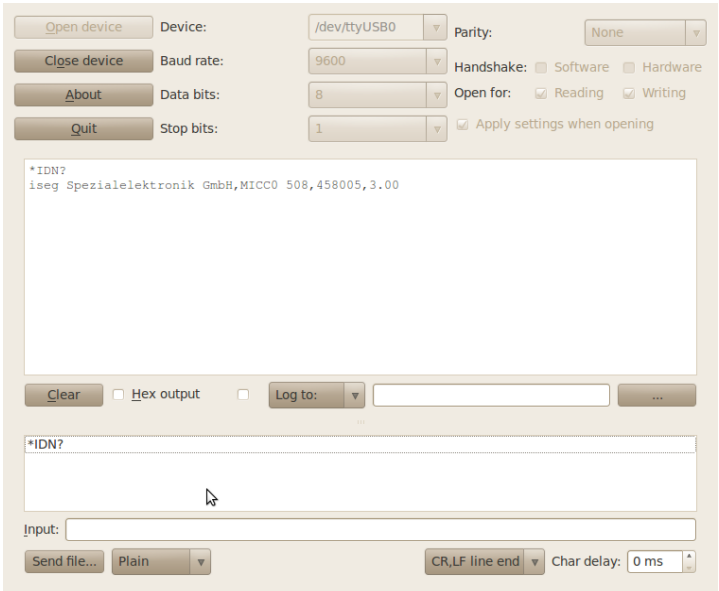
```
[234.496011] usb 1-2: new full speed USB device using uhci_hcd and address 2
[234.694884] usb 1-2: configuration #1 chosen from 1 choice
[234.704371] usb 1-2: New USB device found, idVendor=0403, idProduct=6001
[234.704376] usb 1-2: New USB device strings: Mfr=1, Product=2, SerialNumber=3
[234.704380] usb 1-2: Product: FT232R USB UART
[234.704382] usb 1-2: Manufacturer: FTDI
[234.704385] usb 1-2: SerialNumber: A60075cx
[234.807627] usbcore: registered new interface driver usbserial
[234.807649] usbserial: USB Serial support registered for generic
[234.807679] usbcore: registered new interface driver usbserial_generic
[234.807683] usbserial: USB Serial Driver core
[234.816739] usbserial: USB Serial support registered for FTDI USB Serial Device
[234.816774] ftdi_sio 1-2:1.0: FTDI USB Serial Device converter detected
[234.816805] ftdi_sio: Detected FT232RL
[234.816855] usb 1-2: FTDI USB Serial Device converter now attached to ttyUSB0
[234.816872] usbcore: registered new interface driver ftdi_sio
[234.816876] ftdi_sio: v1.4.3:USB FTDI Serial Converters Driver
```

The following screenshot shows the connection to a NHS with the graphical Terminal program CuteCom (Download at http://cutecom.sourceforge.net).

To communicate with the NHS, following settings are needed:

Device	/dev/ttyUSB0 (or other interface, see dmesg output)
Baud rate:	9600
Data bits:	8
Stop bits:	1
Parity:	None
Handshake:	None
Line end:	CR,LF

Now the serial interface can be opened by „Open device” to test the communication:



3 Common instruction set

The common instruction set is independent from the selected language (SCPI) and can always be used.

*IDN?	Query the module identification reply *iseg Spezialelektronik GmbH,NHS 20 405,930001,1.05*
*CLS	Clear the module (event-)status
*RST	Reset the device to save values: – turn HV off for all channels – set all set voltages to zero for all channels – set all set currents to the current nominal for all channels
*INSTR?	Query the selected instruction set. All NHS devices support EDCP. reply *EDCP*

4 iseg SCPI instruction set

Command	Description
:**VOLT**age	
<Voltage>[V],(@<Channel>)	Set channel voltage set
ON,(@<Channel>)	Switch on High Voltage with configured Ramp speed
OFF,(@<Channel>)	Switch off High Voltage with configured Ramp speed
EMCY OFF,(@<Channel>)	Shut channel High Voltage emergency off (without ramp)
EMCY CLR,(@<Channel>)	Clear shut channel emergency off
:BOUnds <Voltage>[V],(@<Channel>)	Set channel voltage bounds
:**CURR**ent	
<Current>[A],(@<Channel>)	Set channel current set
:BOUnds <Current>[A],(@<Channel>)	Set channel current bounds
:**EV**ent	
CLEAR,(@<Channel>)	Clear channel events
:MASK <Word>,(@<Channel>)	Set channel event mask
:CONFigure	Set/get channel configuration
:TRIP	This function is described in the manual “Delayed Trip”.
:TIME <Time>[ms],(@<Channel>)	Time out with one millisecond resolution (1..4095 ms)
:TIME? (@<Channel>)	query the time out
:ACT ion <Action>	Action 0 – none, flag Event Trip will be set after time out
:ACT ion**?** (@<Channel>)	Action 1 – turn off the channel with ramp Action 2 – shut down the channel without ramp Action 3 – shut down the whole module Action 4 – disable the delayed trip function
:INHibit	Action 0 – none, flag Event External Inhibit will be set
:ACT ion <Action>	Action 1 – turn off the channel with ramp Action 2 – shut down the channel without ramp Action 3 – shut down the whole module without ramp
CONFigure	Set/get module configuration
:RAMP	
:VOLTage <RampSpeed>[%/s]	Set module voltage ramp speed in percent per second
:CURRent <RampSpeed>[%/s]	Set module current ramp speed in percent per second
:AVERage <FilterSteps>	Set number of average steps (1, 16, 64, 256, 512, 1024)
:AVERage**?**	Query the digital filter value
:KILL ENABLE/ DISABLE	Set function kill enable or kill disable
:KILL?	Query the value for the kill enable function
:ADJust ENABLE/ DISABLE	Set function fine adjustment
:ADJust?	Query the fine adjustment
:EVent	
CLEAR	Clear module events
<Word>	Reset module event status
:MASK	Set module event mask
:CHANMASK <Word>	Set module event channel mask

Command	Description
:MEASure	
:VOLTage**?** (@<Channel>)	Query measured channel voltage in Volt
:CURRent**?** (@<Channel>)	Query measured channel current in Ampere
:CONFigure	Set/get module configuration
:CAN	
:ADDRess <Address>	Set modules CAN bus address (0...63) (only in configuration mode)
:ADDRess**?**	Query modules CAN bus address
:BITrate <Rate>	Set modules CAN bus bit rate (125000, 250000) (only in configuration mode)
:BITrate**?**	Query modules CAN bus bit rate
:READ	
:VOLTage**?** (@<Channel>)	Query set voltage value
:LIMit**?** (@<Channel>)	Query voltage limit
:NOMinal**?** (@<Channel>)	Query channel voltage nominal
:BOUnds**?** (@<Channel>)	Query channel voltage bounds
:ON? (@<Channel>)	Query channel control bit setON
:EMCY? (@<Channel>)	Query channel control bit setEMCY
:CURRent**?** (@<Channel>)	Query set current value
:LIMit**?** (@<Channel>)	Query current limit
:NOMinal**?** (@<Channel>)	Query channel current nominal, reply an unsigned value
:BOUnds**?** (@<Channel>)	Query channel current bounds
:RAMP	
:VOLTage**?**	Query module voltage ramp speed (%/s)
:VOLTage**?** (@<Channel>)	Query channel voltage ramp speed (V/s)
:CURRent**?**	Query module current ramp speed (%/s)
:CURRent**?** (@<Channel>)	Query channel voltage ramp speed (A/s)
:MODule	
:CONTrol**?**	Query module control word
:STATus**?**	Query module status word
:EVent	
:STATus**?**	Query module event status word
:MASK?	Query module event mask word
:CHANSTATus**?**	Query module channel event status
:CHANMASK?	Query module channel event mask
:SUPply	
:P24V?	Query module supply voltage +24 V
:N24V?	Query module supply voltage -24 V
:P5V?	Query module supply voltage +5 V
:TEMPerature**?**	Query measured temperature
:CHANnelnumber**?**	Query number of channels
:CHANnel	
:CONTrol**?** (@<Channel>)	Query channel control word
:STATus**?** (@<Channel>)	Query channel status word
:EVent	
:STATus**?** (@<Channel>)	Query channel event status word
:MASK? (@<Channel>)	Query channel event mask word
:FIRMware	
NAME?	Query firmware name
RELease**?**	Query firmware release

Channel 0..NumberOfChannels -1
Space

Command	Description
:SYStem **:USER** **:CONF**ig <SerialNumber> **:CONF**ig 0 **:CONF**ig**?**	 Set the device to configuration mode (to change CAN bit rate and address). Only possible if all channels are off. Set the device back to normal mode Returns 1 in configuration mode, otherwise 0

5 Output formats for voltage and current

Vnominal	**Output format voltage values**
1 V ≤ V_{nom} < 10 V	1.23456V
10 V ≤ V_{nom} < 100 V	12.3456V
100 V ≤ V_{nom} < 1 kV	123.456V
1 kV ≤ V_{nom} < 10 kV	1.23456E3V
10 kV ≤ V_{nom} < 100 kV	12.3456E3V

Inominal	**Output format current values**
10 µA ≤ I_{nom} < 100 µA	12.3456E-6A
100 µA ≤ I_{nom} < 1 mA	123.456E-6A
1 mA ≤ I_{nom} < 10 mA	1.23456E-3A
10 mA ≤ I_{nom} < 100 mA	12.3456E-3A
100 mA ≤ I_{nom} < 1 A	123.456E-3A

For high precision NHS (N06C2), there are some differences:

- the voltage format has one digit more precision
- the current format is the same, but a second current measurement range with the corresponding exponent exists. Common exponent are E-3 and E-6.

5.1 Examples

Set channel 2 voltage to 1000.501V :VOLT 1000.501,(@2)
Set channel 2 current to 1.58mA :CURR 0.00158,(@2)
Set channel 2 on :VOLT ON,(@2)
Set channel 2 off :VOLT OFF,(@2)
Set voltage ramp speed to 10 % of Vnominal per second :CONF:RAMP:VOLT 10

5.2 Advanced Examples

// Set voltage ramp speed for all channels to 20 percent of Vnominal per second:
:CONF:RAMP:VOLT 20%/s

// Query measured voltage and current values from channel 1:
:MEAS:VOLT? (@1); CURR? (@1)
2.00002V; 1.99973E-3A

// Set voltage set value to 1000 Volt for channel 0, and 2 to 4:
:VOLT 1000V,(@0,2-4)
// Query voltage set value of channel 0, and 2 to 4:
:READ:VOLT? (@0,2-4)
1.00000E3V,1.00000E3V,1.00000E3V,1.00000E3V
// Set HV on for channel 0, and 2 to 4:
:VOLT ON,(@0,2-4)

6 Description of the single bits of control, status, event status and mask and data points

6.1 Channel Status (read access)

:READ:CHANnel:STATus? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
VLIM	CLIM	TRP	EINH	VBND	CBND	res	LCR	CV	CC	EMCY	RAMP	ON	IERR	res	POS

The ChannelStatus register describes the actual status. Depending on the status of the module the bits will be set or reset.
The bit InputError will be set if the given parameter is not plausible or it exceeds the module parameters (e.g. if the command Vset=4000V is given to a module with NominalVoltage=3000V). The bit InputError is not set if the given values are temporarily not possible (e.g. Vset=2800 at a module with NominalVoltage=3000V, but HardwareLimitVoltage=2500V). A certain signature which kind of input error it is does not exist.

VLIM	VoltageLimitExceeded	voltage limit set by V_{max} is exceeded
CLIM	CurrentLimitExceeded	current limit set by I_{max} is exceeded
TRP	TripExceeded	Trip is set when Voltage or Current limit or Iset has been exceeded (when KillEnable=1)
EINH	ExtInhibit	External Inhibit
VBND	VoltageBoundsExceeded	Voltage out of bounds
CBND	CurrentBoundsExceeded	Current out of bounds
LCR	Low Current Range	Device measures in Low Current Current Range (for devices with 2 current ranges only)
CV	ControlledVoltage	Voltage control active (evaluation is guaranteed when no ramp is running)
CC	ControlledCurrent	Current control active (evaluation is guaranteed when no ramp is running)
EMCY	EmergencyOff	Emergency off without ramp
ON	On	On
RAMP	Ramping	Ramp is running
IERR	InputError	Input error
POS	IsPositive	Polarity of the HV (for devices with EPU only)
res	Reserved	

isVLIM=0 channel is ok
isVLIM=1 the hardware voltage limit is exceeded
isCLIM=0 channel is ok
isCLIM=1 the hardware current limit is exceeded
isTRP=0 channel is ok
isTRP=1 V_O is shut off to 0V without ramp because the channel has tripped.
isEINH=0 channel is ok
isEINH=1 External Inhibit was scanned
isVBND=0 channel is ok
isVBND=1 |Vmeas - Vset| > Vbounds
isCBND=0 channel is ok
isCBND=1 |Imeas - Iset| > Ibounds
isCV=1 channel is in state of voltage control
isCC=1 channel is in state of current control
isEMCY=1 channel is in state of emergency off,
VO has been shut off to 0V without ramp
isON=0 channel is off
isON=1 channel voltage follows the Vset value
isRAMP=0 no voltage is in change
isRAMP=1 voltage is in change with the stored ramp speed value
IERR=0 no input-error
IERR=1 incorrect message to control the module
isPOS=1 positive polarity
isPOS=0 negative polarity

6.2 Channel Event Status (read-write access)

:READ:CHANnel:EVent:STATus? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
EVLIM	ECLIM	ETRP	EEINH	EVBNDs	ECBNDs	res	res	ECV	ECC	EEMCY	EEOR	EOn2Off	EIER	res	res

EVLIM	EventVoltageLimit	Event: Hardware- voltage limit has been exceeded
ECLIM	EventCurrentLimit	Event: Hardware- current limit has been exceeded
ETRP	EventTrip	Event: Trip is set when Voltage or Current limit or Iset has been exceeded (when KillEnable=1)
EEINH	EventExtInhibit	Event external Inhibit
EVBNDs	EventVoltageBounds	Event: Voltage out of bounds
ECBNDs	EventCurrentBounds	Event: Current out of bounds
ECV	EventControlledVoltage	Event: Voltage control
ECC	EventControlledCurrent	Event: Current control
EEMCY	EventEmergencyOff	Event: Emergency off
EEOR	EventEndOfRamp	Event: End of ramp
EOn2Off	EventOnToOff	Event: Change from state "On" to "Off"
EIER	EventInputError	Event: Input Error
res	Reserved	

An event bit is permanently set if the status bit is “1” or is changing to “1”. Different to the status bit an event bit isn't automatically reset. A reset has to be done by the user by writing “1” to this event bit.

6.3 Channel Event Mask (write access, read access)

:CONF:EVent:MASK? UI2
:READ:CHANnel:EVent:MASK? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MEVLIM	MECLIM	METRP	MEEINH	MEVBNDs	MECBNDs	res	res	MECV	MECC	MEEMCY	MEEOR	MEOn2Off	MEIER	res	res

MEVLIM	MaskEventVoltageLimit	EventMask: Hardware- voltage limit has been exceeded
MECLIM	MaskEventCurrentLimit	EventMask: Hardware- current limit has been exceeded
METRIP	MaskEventTrip	EventMask: Voltage limit or Current limit or Iset has been exceeded (when KillEnable=1)
MEEINH	MaskEventExtInhibit	EventMask: External Inhibit
MEVBNDs	MaskEventVoltageBounds	EventMask: Voltage out of bounds
MECBNDs	MaskEventCurrentBounds	EventMask: Current out of bounds
MECV	MaskEventControlledVoltage	EventMask: Voltage control
MECC	MaskEventControlledCurrent	EventMask: Current control
MEEMCY	MaskEventEmergencyOff	EventMask: Emergency off
MEEOR	MaskEventEndOfRamp	EventMask: End of ramp
MEOn2Off	MaskEventOnToOff	EventMask: Change from state on to off
MEIER	MaskEventInputError	EventMask: Input Error
res	Reserved	

6.4 Channel Control (read access)

:READ:CHANnel:CONTRrol? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
res	res	res	res	res	res	res	res	res	res	setEMCY	res	setON	res	res	res

The signals SetOn and SetEmergencyOff control are basic functions of the channel. The signal SetOn is switching ON the HV of the channel and is a precondition for giving voltage to the output. As far as a VoltageSet has been set and no event has occurred and is not registered yet (in minimum, bit 10 to 15 of the register Channel Event Status must be 0), a start of a HV ramp will be synchronized (a ramp is a software controlled, time proportionally increase / decrease of the output voltage).

setEMCY	SetEmergencyOff	Set “Emergency Off”
setON	SetOn	Set On
res	Reserved	

setEMCY=0 Channel is not in state Emergency Off
setEMCY=1 Channel is in state Emergency Off: shut down the channel without ramp
setOn=0 switch the channel to OFF
setOn=1 switch the channel to ON
(If Vset has been set to a value unequal to zero (0V) before the status bit ‘isOn’ is changed from (1) one to (0) zero a ramp down of the voltage to zero (0V) will be started.)

6.5 Module Status (read access)

:READ:MODule:STATus? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
isKILena	isTMPgd	isSPLYgd	isMODgd	isEVNTact	isSFLPgd	isnoRAMP	isnoSERR	res	isIERR	isHwVLgd	isSrvc	res	res	res	isADJ

The status bits as there are IsTemperatureGood, IsSupplyGood, IsModuleGood, IsEventActive, IsSafetyLoopGood, IsNoRamp and IsNoSumError indicate the single status for the complete module.

isKILena	IsKillEnable	Module state of kill enable
isTMPgd	IsTemperatureGood	Module temperature good
isSPLYgd	IsSupplyGood	Power supply good
isMODgd	IsModuleGood	Module in state good
isEVNTact	IsEventActive	Any event is active and mask is set
IsSFLPgd	IsSafetyLoopGood	Safety loop closed
isnoRAMP	IsNoRamp	All channels stable, no ramp active .
isnoSERR	IsNoSumError	Module without failure
IsIERR	IsInputError	Input error in connection with a module access
IsSrvc	IsService	Hardware failure detected (consult iseg Spezialelektronik GmbH)
isADJ	IsFineAdjustment	Mode of the fine adjustment
res	Reserved	

isKILLena=0 Module in state kill disable
isKILLena=1 Module in state kill enable

isTMPgd=0 if module temperature is higher than 55°C then all channels are switched off permanently
isTMPgd=1 module temperature is within working range

isSPLYgd=0 supply voltages are out of range (range 24V +/-10% and 5V +/-5%)
isSPLYgd=1 supply voltages are within range

isMODgd=0 module is not good, that means (isnoSERR AND (ETMPngd OR ESPLYngd OR ESFLPngd))==0
isMODgd=1 module is good, that means (isnoSERR AND NOT(ETMPngd OR ESPLYngd OR ESFLPngd))==1
(see module event status also)
isSFLPgd=0 safety loop is broken -V_O bas been shut off,
isSFLPgd=1 safety loop is closed

isEVNTact=0 no Event is active
isEVNTact=1 any Event is active

isnoRAMP=0 V_O is ramping in at least one channel
isnoRAMP=1 no channel is ramping

isnoSERR=0 voltage limit, current limit, trip, voltage bound or current bound has been exceeded in at least one of the channels or external INHIBIT ⇒ error, reset by reset of the corresponding flag of the 'Channel Status'
isnoSERR=1 evaluation of the 'Channel Status' over all channels to a sum error flag ⇒ LIM&CLIM&CTRP&EINH&VBND&CBND=0 ⇒ no errors
isIERR=1 input error in connection with a module access
isIERR=0 no input error in connection with a module access

isADJ=0 Fine adjustment is off.
isADJ=0 Fine adjustment is on (default)

6.6 Module Event Status (read access)

:READ:MODule:EVent:STATus? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
res	ETMPngd	ESPLYngd	res	res	ESFLPngd	res	res	res	EIERR	EHwVLngd	ESrvc	res	res	res	res

ETMPngd	EventTemperatureNotGood	Event: Temperature is above 55°C
ESPLYngd	EventSupplyNotGood	Event: at least one of the supplies is not good
ESFLPngd	EventSafetyLoopNotGood	Event: Safety loop is open
EIERR	EventInputError	Event: input error in connection with a module access
ESrvc	EventService	Event: A hardware failure of the HV module has been detected. The HV will switched off without a possibility to switch on again. Please consult iseg Spezialelektronik GmbH.
EHwVLngd	EventHardwareVoltageLimitNotGood	Event: Hardware voltage limit is not in proper range, only for HV distributor modules with current mirror;

6.7 Module Event Mask (read-write access)

:CONF:EVent:MASK?
:READ:MODule:EVent:MASK? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
res	METMPngd	MESPLYngd	res	res	MESFLPngd	res	res	res	MEIERR	MEHwVLngd	res	res	res	res	res

METMPngd	MaskEventTemperatureNotGood	MEventMask: Temperature is above 55°C
MESPLYngd	MaskEventSupplyNotGood	MEventMask: at least one of the supplies is not good
MESFLPngd	MaskEventSafetyLoopNotGood	MEventMask: Safety loop (SL) is open
MEIERR	MaskEventInputError	MEventMask: Input error in connection with a module access
MEHwVLngd	MaskEventHardwareVoltageLimitNotGood	MEventMask: Hardware voltage limit is not in proper range, only for HV distributor modules with current mirror;
res	Reserved	

All bits of the EventMask register are set to “0” after the power on reset.

Module in mode KILL enable: If a bit of the EventStatus register is set to “1” and the corresponding bit in the EventMask register is “0” no reset of the EventStatus bits is necessary before switch on the HV of any channel again.

If a bit of the EventMask register is set to “1” and if the corresponding bit in the EventStatus register is set to “1” by the module, a reset of the corresponding EventStatus bits is necessary before a switch on of any channel is possible.

6.8 Module Event Channel Status (read-write access)

:READ:MODule:EVent:CHANSTATus? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
CH15	CH14	CH13	CH12	CH11	CH10	CH9	CH8	CH7	CH6	CH5	CH4	CH3	CH2	CH1	CH0

The n-th bit of the register is set, if an event is active in the n-th channel and the associated bit in the EventMask register of the n-th channel is set too.

CHn = EventStatus[n] & EventMask[n]

Reset of a bit is done by writing a 1 to this bit.

Module Control (read-write access)

:READ:MODule:CONTRol? UI2

Bit15	Bit14	Bit13	Bit12	Bit11	Bit10	Bit9	Bit8	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
res	setKILena	res	setADJ	set ENDN	res	res	res	res	doCLEAR	res	res	res	res	res	res

setKILena	KillEnable	Kill function
setADJ	Adjust	Switch ON of fine adjustment
setENDN	Endian	Order of bytes in word: 0 = Little Endian (INTEL); 1 = Big Endian (MOTOROLA)
doCLEAR	ClearKill	Hardware ClearKill signal and clear all event signals of the module and the channels
res	Reserved	

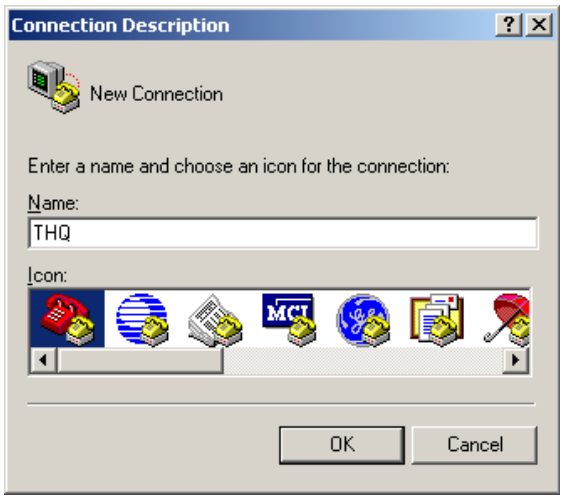
setKILL=0 kill function disable
setKILL=1 kill function enable
setADJ=0 fine adjustment OFF
setADJ=1 fine adjustment ON
setENDN=1 big endian (MOTOROLA format)
doCLEAR=1 Hardware ClearKill signal and clear all event signals of the module and the channels
doCLEAR=0 no action

7 HyperTerminal

HyperTerminal is included in Windows 2000 / XP and can be started with:

Start → Programs → Accessories → Communications → HyperTerminal

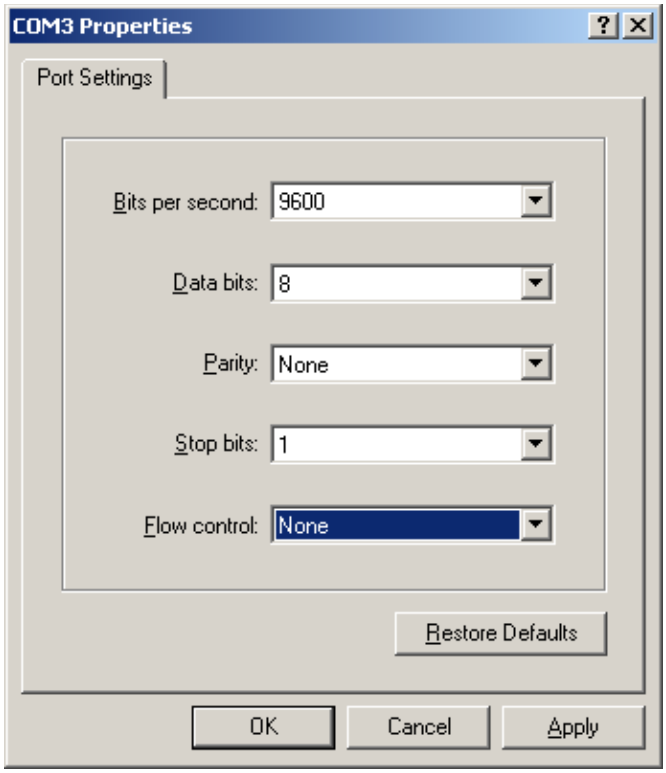
Create a new connection with menu “File → New Connection“, name it e.g. “NHS” and click OK.



The following dialog appears. Choose your serial port and click OK:

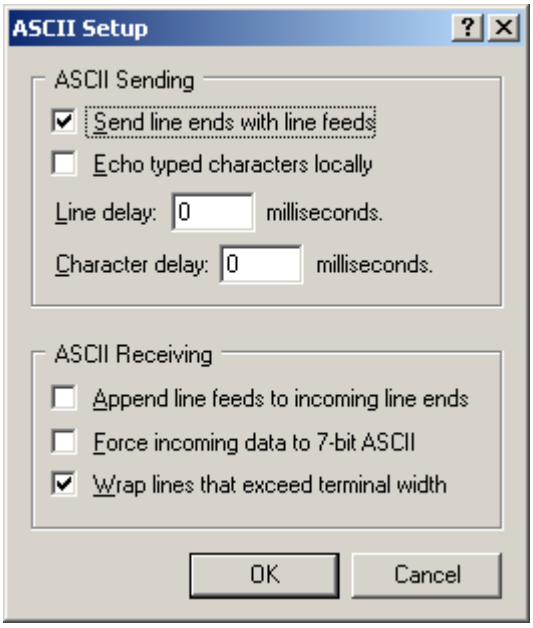
iseg Spezialelektronik GmbH
Bautzner Landstr. 23
D - 01454 Radeberg / Rossendorf
Email: sales@iseg-hv.de
http://www.iseg-hv.com
Germany
Phone ++ 49 351 / 26 996 - 0
Fax ++ 49 351 / 26 996 - 21

Please enter the the interface parameters in the following dialog:

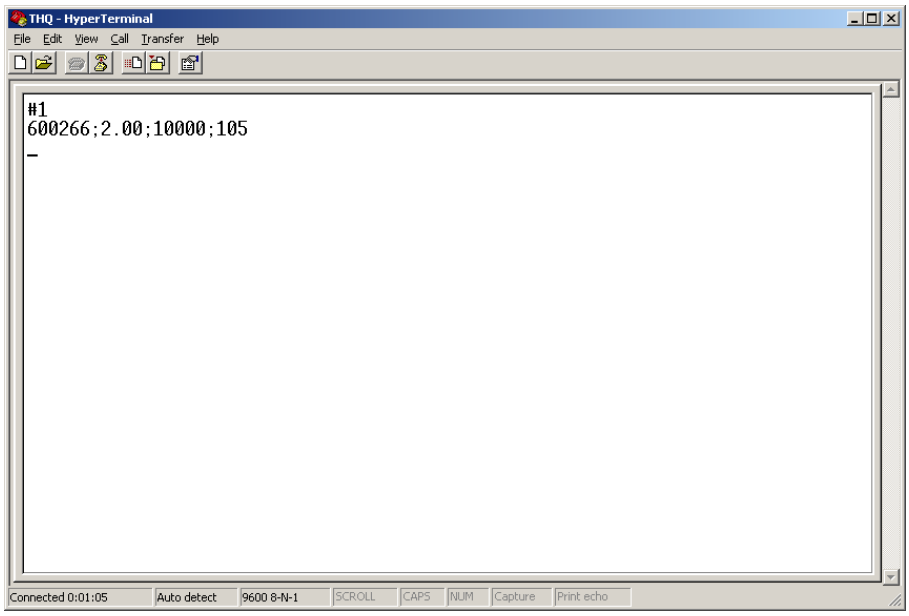


After clicking OK, the interface setup is finished.

As last setting, The setting “Send line ends with line feeds” has to be made (see following picture).



You can now test the communication with the device:



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8 isegTerminal

isegTerminal is a Windows program to control iseg devices with RS-232, USB, GPIB (IEEE-488) or Ethernet interface using their ASCII command sets.

The latest version is available from the iseg website:

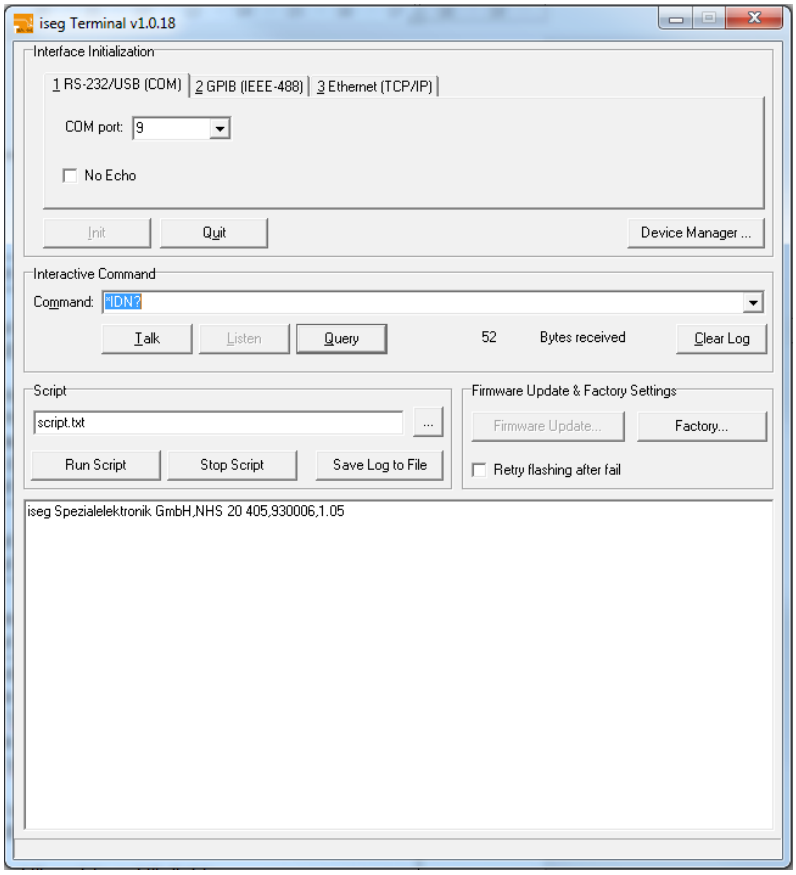
http://download.iseg-hv.com → Software → Tools → “isegTerminal-win32-1.0.xx.zip”

For serial communication, choose “1 RS-232/USB” in the Interface List and select the COM-Port you connected your iseg device to. With a click on Init, the serial port is opened and you can send commands to your device by clicking the Query button (or simple pushing the Enter key).

The answer is shown in the output window.

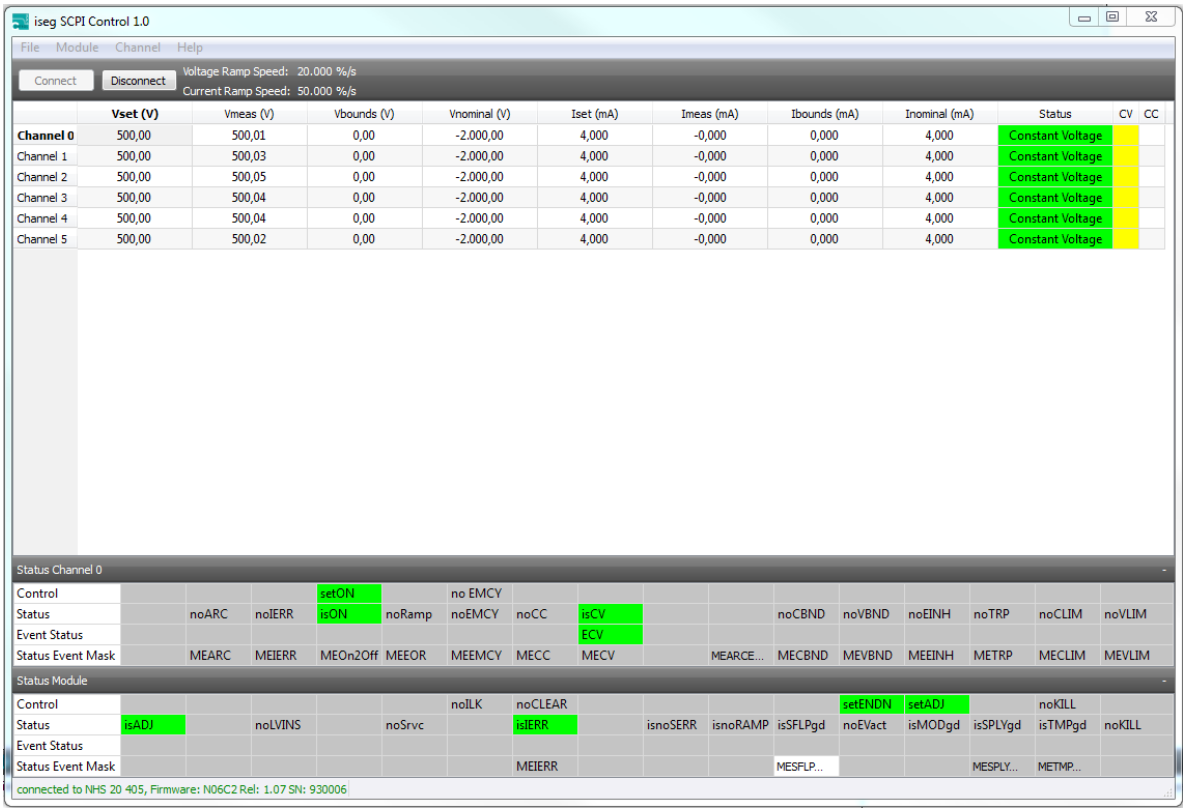
For detailed command set descriptions, please see the documentation for the specific device.

The following command is used for device identification query: “*IDN?”



9 iseg SCPI Control

isegScpiControl is a Windows program to control the NHS devices via USB interface. All important data points will be displayed via a table and an input of new set value can be made via short cuts. The corresponding short cuts are displayed with the text entries of the menu bar.



The control of NHS devices via USB requires a driver installation (see chapter 2).

The connection will be established by means of the button “Connect” and a continuous request of the data points is started.

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