USB devices made by Cleware

User Manual

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1. Introduction

All Cleware devices are USB devices, connected with a 2 m USB cable. The devices will be detected automatically by all Windows® versions since Windows® 2000 (® Microsoft Windows is a registered trademark of the Microsoft Corporation). The Cleware devices would also operate with some versions of Linux.

No device driver are needed to operate the Cleware devices with Windows®. The already installed standard USB drivers are sufficient. This keeps the stability of the PC.

Depending of the configuration of the PC, about 40 USB devices could be connected. In case of Linux, only 16 Cleware USB devices are supported.

Every Cleware USB device got its own unique serial number. This makes it possible to identify a certain device even if the position in the USB hubs have been changed. The serial number could also be used by user programs so the device may be used as a simple dongle.

The controlling of all Cleware devices is done by the program „ClewareControl". This program will also do the visualisation of the measured values and states. For simple integration of the devices in the users environment, simple command line tools are part of the delivery. These could be used to control the devices directly. The supplied software is described in the software manual.

An application interface (API) is supplied to control the Cleware devices from user programs. It consist of a couple of simple functions. The complexity of the USB interface is hidden. For the use with Visual Basic an ActiveX control is available.

Caution: It is strongly prohibited to use any of the Cleware devices, if the failure of the product may harm people. Usage in any medical applications is also prohibited.

New ab Version 4.0.0:
The integration of the USB-TrafficLight (USB-Ampel) in ClewareControl was redisigned to ease the use as an alarm indicator for sensors or events. It is now possible to let the USB-TrafficLight indicate the state of several sensors.

ClewareControl saves and interprets the device status in the registry. Accessing temperature or other states is now possible though by reading the registry.

2. USB-Temp

The housing of the sensor is made of black anodized aluminium. It is filled with casting resin which complies with the best non-inflammability class V-O as per UL 94. The size of the sensor is 25 mm x 15 mm x 40 mm. The USB cable is about 2 m long. The current needed by this USB device is less than 20 mA.

st place
measure

To get the best results, the object to by measured should be placed at the position shown above. The sensor is thermical connected with the aluminium housing so changes in temperature will cause an immediate reation.

The temperature is measured in steps of 0,0625° Celsius. The accuracy ist at least 1° Celsius. The sensor could be calibrated with the software "ClewareControl". Before delivery the USB-Temps are calibrated with an accuracy of 0,2° Celsius. The operating temperature should be between -20° and +80° Celsius. Using it outside this range may cause the destruction of the sensor. If temperature falls below 0° C the cable must not be moved or bent.

The construction of the USB-Temp is very robust. Even hard conditions like shown below will not harm the sensor.

The casting resign protects the sensor against humidity. The sensor must not be located under water for a long time, because the plastic may suck up water very slowly. The is no warranty that the materials of the sensor will not react with components of wet or aggressive environments. For use inside aquariums the special product USB-AquaTemp should be used.

The display of the measured values are done with the software "ClewareControl". This software could be configured to activate an alarm on several ways.
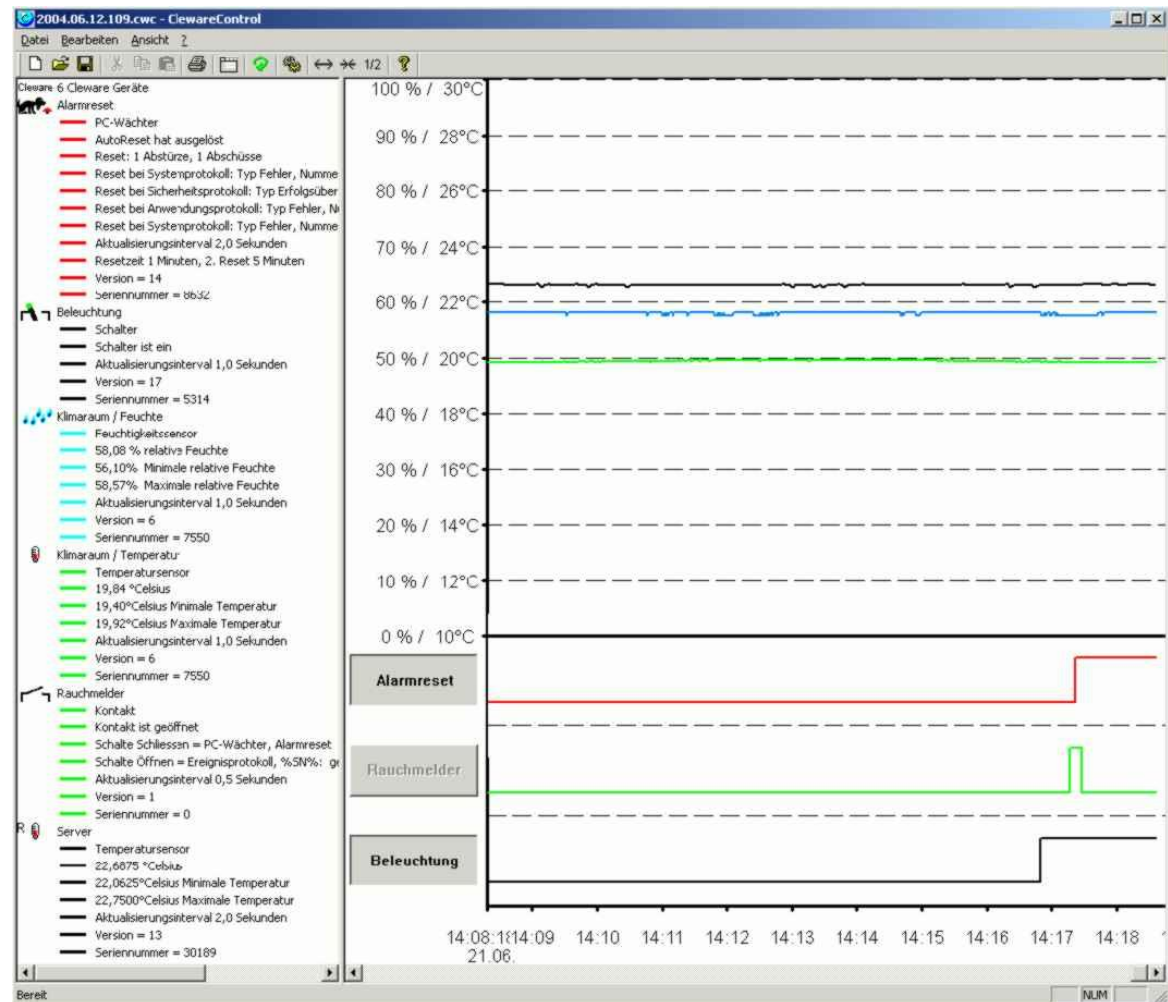
3.   USB-Humidity

High precision humidity and temperature measurement is the domain of the sensor device USB-Humidity.

In contrast to USB-Temp, which measures though the housing, the USB-Humidity measures the air temperature and humidity directly using a hole in the middle of the housing. The dimension of the device is about 44 x 30 x 23 mm. The operating temperature should be between -20° and +80° Celsius. Using it outside this range may cause the destruction of the sensor. If temperature falls below 0° C the cable must not be moved or bent.

The device makes use of a calibrated high precision sensor. The resolution is 0,5 % relative humidity and 0,04° C. The accuracy in most part of the measurement range is ±2 % relative humidity and ±0,4° Celsius measured in slow air flow. The absolute accuracy is shown below:
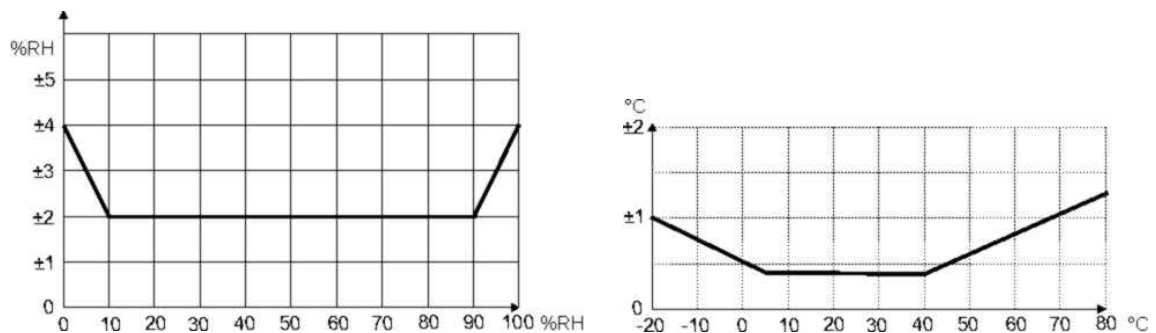
The device is controlled by ClewareControl with alarm functions for humidity and temperature.

4. USB-Switch

The PC controlled power switch „USB-Switch" turns devices operated at 230 V on and off. The maximum current is 16 A, maximum 3.500 W rated load AC1 (non inductive). The single phase motor rating is 550 W. Please contact the dealer of the device to be switched for more information.

The USB-Switch should be operated in inner rooms only and should be protected against humidity. The permissible operating temperature range is 10° - 60° Celsius.

The software ClewareControl may turn the USB-Switch into a time switch. Different repeat interval, start and end times may be specified.

Some very interesting applications could be created with the combination of an USB-Switch with an USB-Temp sensor. The software ClewareControl will then turns the USB-Switch on and off in direct reaction of the temperature measured by the sensor. This could be used to control heating or cooling devices.

The size of the switch is about 55 x 85 x 80 mm. At the bottom a german plug (Schuko) connects to the wall socket. In foreign countries an adapter with sufficient rating may be used. A german socket (Schuko) is located in the top of the switch. It will accept also EURO plugs. Next the socket a LED is located to indicate the switch state. The LED is red if the switch is off and it will turn to green if the switch is on.

Please notice:
PC programs may fail or may be disturbed or manipulated by other programs. Don't operate devices with the USB-Switch where unexpected switching may cause damage!

Using ClewareControl, the state of the Switch could be time controlled, e.g. turned on and off every 10 seconds. Or turned on on Monday, 11:00 and off on Tuesday 7:00.

5.   USB-Switch C

The USB-Switch is also available as an **USB-SwitchC** with 50 cm long mains cables instead of plug and socket. Appropriate connectors could be installed by the customer according to the country standards. No mains socket and plug are part of the device itself. Beside of this the device is identical to the USB-Switch.

6.   USB-Switch International

Wir bieten auf der Basis des USB-SwitchC verschiedene Auslandsversionen und eine IEC-Kaltgerätestecker-Version an. Verfügbar sind Geräte für England, Frankreich, Belgien, Schweiz, Italien und IEC.

7. USB-Switch ATXX

The ATXX version of the USB-Switch is nearly identical to the normal USB-Switch. The only difference is the fact, that the USB-Switch ATXX turns the power on after the first activation of the USB interface. This could be used to turn on peripheral devices with the PC, e.g. the monitor. The switching capabilities are still available, so the power could be turned off and on anytime via software.

The device USB-AutoReset could also be configured to act like an USB-Switch ATXX. In this case, only the first relais is turned on when power is supplied to the USB bus.

Using ClewareControl the USB-Switch ATXX could also be reconfigured as an USB-Switch.

8. USB-Switch 3

Three USB-Switches in one housing are available with the product USB-Switch 3. Every single mains socket is controlled independantly and the state is shown with a LED. The maximum current through the USB-Switch 3 is 16 A at 240 V. This total current may be distributed by the three sockets in any way.

The size of the USB-Switch3 is about 180 x 120 x 65 mm. The mains cord with the schuko plug is about 1,8 m long, the USB cable about 1,7 m.

9. USB-Switch 4

The USB-Switch 4 is almost identical to the USB-Switch 3 except it offers four mains sockets. The total load of all sockets must not exceed 3500 Watt.

10. USB-Switch 8 Pin Plug

Build especially for testing fields the **USB-Switch 8 Pin Plug** offers all contacts of 8 highly reliable relays on widely used pin plug sockets. All relays are totally independent from each other. The common relay contact is assigned to the black socket, the opening contact is the red and the closing contact the green socket. The maximal voltage allowed is 30 V, the maximal current is 3 A.

11. USB-Watchdog XP

The USB-WatchdogXP resets the PC after a failure in a very simple way - it just disconnects the PC for some seconds from mains. It requires no manipulation inside the PC except the BIOS must enable automatic boot when power is applied.

The USBwatchdogXP uses an opening relais. Without intervention the mains socket is supplied with current. If the current should be interrupted this is done by turning the relais on.. Next to the socket a LED is located to indicate the switch state. The LED is green if the PC is running and red if the a malfunction has been detected and the switch is active. When the USB-Watchdog XP waits longer than 10 seconds for service the LED turns to yellow to indicate a kind of prealarm

The USB-WatchdogXP waits for a sign of life from the PC. If this sign will not be detected for a destinct time, the relais inside the USB-WatchdogXP will be activated. The connected device is now dropped out.

The size of the USB-WatchdogXP is about 55 x 85 x 80 mm. At the bottom a german plug (Schuko) connects to the wall socket. In foreign countries an adapter with sufficient rating may be used. A german socket (Schuko) is located in the top of the switch. It will accept also Euro-plugs.

The USB-WatchdogXP turns devices operated at 230 V on and off. The maximum current is 16 A, maximum 3.500 W rated load AC1 (non inductive). The single phase motor rating is 550 W. Please contact the dealer of the device to be switched for more information. The USB-WatchdogXP should be operated in inner rooms only and should be protected against humidity. The permissible operating temperature range is 10° - 60° Celsius.

The usage of the USB-Watchdog is strictly prohibited when the failure of the sensor will harm people.

12. USB-AutoReset

Similar to the USB-Watchdog the USB-AutoReset suvervises the PC and detect system crashes. If this case occure a hardware reset will be done to restart the PC. To do that the reset input of the main board is connected to the USB-AutoReset. A appropriate cable is

supplied. The freed connection to the reset button could be inserted in the USB-AutoReset to preseve the reset capability of the button.

The size of the USB-AutoReset is about 40 x 90 x 23 mm. The contacts are able to switch 30 V and 0,5 A maximum. The USB-AutoReset should be operated in inner rooms only and should be protected against humidity. The permissible operating temperature range is 10° - 60° Celsius. The connection to the PC is done by the standard 2 m USB cable. On request, the device could be deliverd with a 50 cm cable and a plug for direct connection to the main board.

The USB-AutoReset expects a life signal from the PC. After receiving one, the LED on top of the case will turn to green, The 'still alive' signal may be generated by Cleware-Control, USBwatch or by using the APIs from an user application. After 1 to 255 minutes of silence, depending on the configuration, the reset will be activated for about 1,5 seconds and the LED turns to red. The same time, the second relais turns on and stays on until new life signal will be received. 50 seconds before the timeout is over, the LED turns to yellow. The time to reset is defined with the life signals transferred to the USB-AutoReset.

The life signal contains a second parameter, which defines the time that is allowed after the reset to reanimate the PC. After this time, another reset will be initiated. If this parameter is set to 0, no second reset will be done. The time defined with the second parameter is also used at the cold start of the USB-AutoReset.

The reset could also be initiated by the PC itself. This is done by sending a command to the USB-AutoReset. The program ClewareControl also supports the monitoring of the event log. If former defined events occure, a reset will be initiated. This could be useful when disk errors were detected. A hard reset at this time may shorten the restart time.

The USB-AutoReset supplies two reset counters, one for reset by command and one for resets by timeout.

The same way as the USB-Switch, the USB-AutoReset could be reconfigured to act as an USB-Switch, an USB-Switch ATXX or USB-Watchdog. Two independant relais are available when running as an USB-Switch.
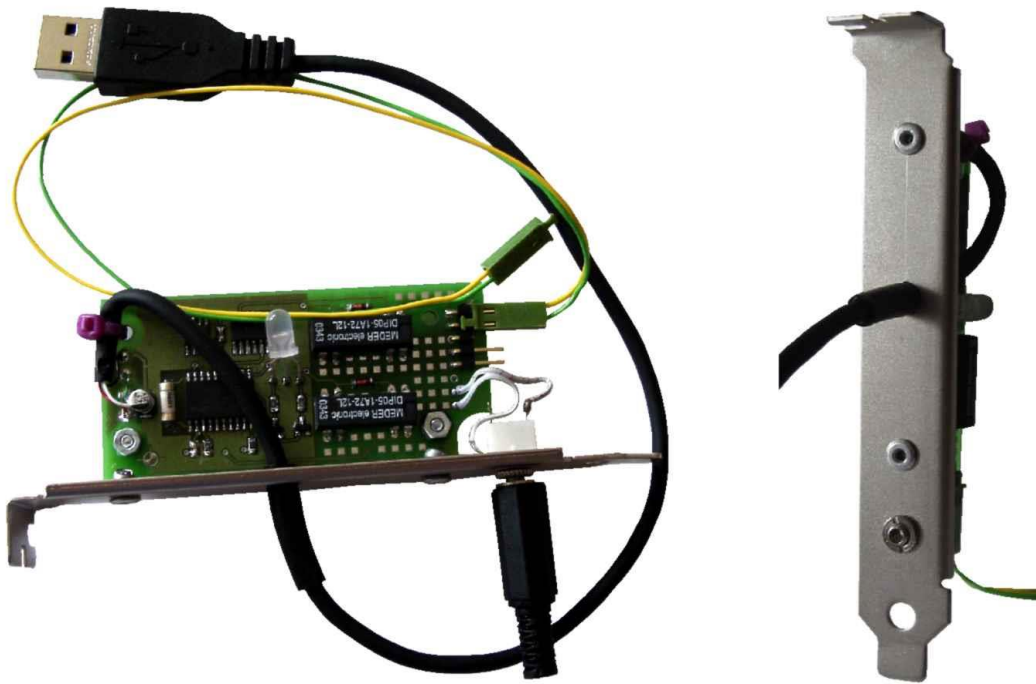
The USB-AutoReset connectors look like this

R1b: connected with the reset input on the mainboard

R1a: connected to the reset button

R2: second relais, could be used for a dialer

13. USB-AutoReset / USB-Relais Slotversion

The device USB-AutoReset is also availabel as a slot version to install it inside the PC. The electronics are mounted on a slot bracket. The USB cable is about 25 cm long and placed through the slot bracket. Alternatively the USB cable could be supplied with a 4 pin plug for direct connection on the main board.

The second relais is connected to a 3,5" stereo jack. The connection schema is shown below. The pin in the middle is connected to the PC housing.
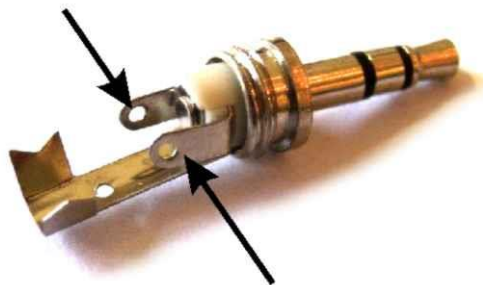
14. USB-IO16

The USB-IO16 contains 16 channels which could be indendantly configured as input or output. The input channel are designed to operate with potentialfree contacts. The contact is connected on one side with the correct channel and on the other side with signal ground (Gnd). The state of the contact is available on the PC.

The contacts configured as output are directly connected with +5V when turned on. **When this output is connected directly with ground, this will result in a short-circuit and a destroyed device! This is not covered by the guarantee!** The circuit must be choosen in a way that the maximum current of this channel does not exceed 50 mA. The total power consumption of all output channels must not exceed 160 mA.

The channel are available on a 25 pin D-Sub plug which has the folowing standard layout:
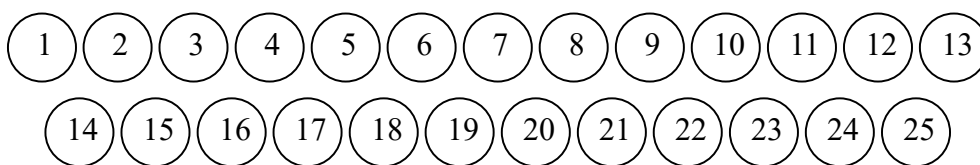
The channels are assigned to the pins of the D-Sub plug in a way that with the use of a ribbon cable channels 1 to 9 are available the ground next to them:

D-Sub Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	23	24	25	14 - 22
Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Ground

Sample with one input contact at channel 1 and a display LED at channel 2:
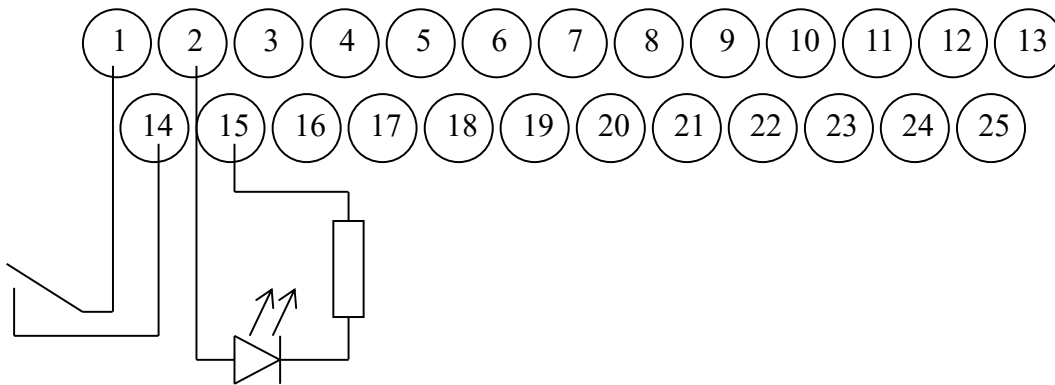
Many USB-IO16 devices could be connected simultaneously at one PC. The devices are addressed using the serial number, which differs for each device. So a huge number of contacts could be supported.

The size of the USB-IO16 is about 40 x 90 x 23 mm. The USB-IO16 should be operated in inner rooms only and should be protected against humidity. The permissible operating temperature range is -20° - +80° Celsius. The connection to the PC is done by a standard 1.8 m USB cable.

As an option a connectivity set is available for the USB-IO16. It contains a 1 m ribbon cable, an appropriate D-Sub plug and a plug for soldering.

On request the USB-IO16 is available mounted on a slot bracket.
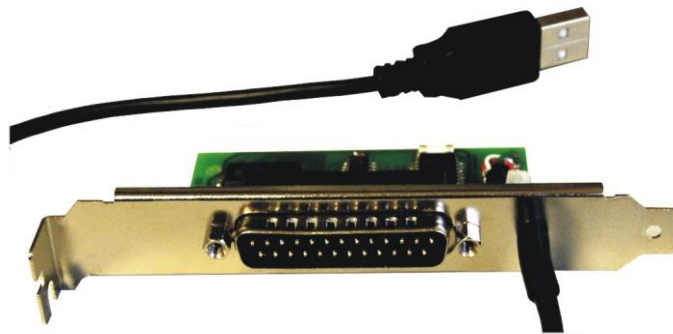
15. USB-Key16 / USB-Key24 from 10.2016

The device USB-Key16 / USB-Key24 offer the possibility to connect 16 - 24 different keys which will send individually keyboard codes. The USB-Key16 show up a like standard USB keyboard when connecting to the PC. When a channel is switched it will send a preprogrammed key code to the PC.

The USB-Key16 / USB-Key24 is 40x90x23mm in size. The USB-Key16 / Key24 is for indoor use only and should be protected against humidity. The permissible operating temperature range is 10° C - 60° C. The device is equipped with an approx. 2.0 m USB cable.

D-Sub Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Ground

The switches can be connected directly with the USB-Key16 / Key24, e.g. the first switch with pin 1 and pin 25. A resistor is not necessary.

The product USB-Key16 / Key24 will be delivered with a 4-year warranty. The newest version of all-software is ready for download on our download section at our website.

16. USB-Opto + Reed

For cases when potential free Input or Outputs were needed we developed a special device family based on the USB-IO16. Input is realized using opto couples and output is done with reed relais. The connection is done without screwing or soldering using clemp connectors.

Base of this device family is the USB-Opto 8. This device is equipped with 8 opto coupler input channels. The insulation voltage is well above 5.000 V. The opto coupler is operated @ 1,2V/10mA. The connectors are labeled with Gnd and +. If additional opto input channels are needed, a second input circuit with another 8 channels is available.

Whe output channels are needed, we offer 4 or 8 relais output channels which could be added to the base device. The relais are available with closing or if needed with change over contacts.The reed relais are high reliability Meder® relais. The relais are capable to switch 0.5A @ 30V.

The device is available in these configurations:

DEVICE	Description
USB-Opto 8	8 Opto couplers
USB-Opto 8 L	dito with 3,7 m USB cable
USB-Opto 16	16 Opto couplers
USB-Opto 16 L	dito with 3,7 m USB cable
USB-Reed 4 W Opto 8	8 Opto couplers 4 reed change over relais
USB-Reed 4 W Opto 8 L	dito with 3,7 m USB cable
USB-Reed 8 W Opto 8	8 Opto couplers 8 reed change over relais
USB-Reed 8 W Opto 8 L	dito with 3,7 m USB cable
USB-Reed 4 S Opto 8	8 Opto couplers 4 reed closing relais
USB-Reed 4 S Opto 8 L	dito with 3,7 m USB cable
USB-Reed 8 S Opto 8	8 Opto couplers 8 reed closing relais

USB-Reed 8 S Opto 8 L	dito with 3,7 m USB cable

The USB-OptoReed Series uses a 85 x 55 x 45 mm housing. The USB cable length is approx. 2 m or 3.7 m. The devices are for indoor usage only and must be protect against humidity. The operating temperature range is -20°* and +80° Celsius. Below 0° Celsius the connecting cords must not be moved.

17. USB-ADC

- USB analog-to-digital converter: is a device that converts an analog signal to a digital signal through USB connection.
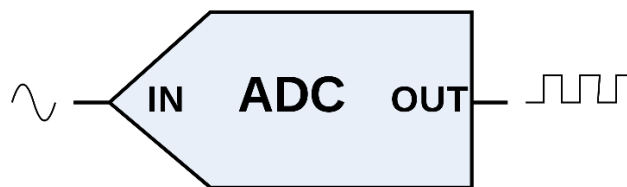
- ADC may also provide an isolated measurement like an electronic device that converts an input analog voltage to a digital number representing the size of the voltage

- The USB-ADC provides 2 channels (0 und 1) , first you need to know the range it range it has to work : 5v, 13v or 24v than you have to select the channel to read from, after selecting the channel, you can keep on reading the value.
- The value is determined by the voltage divider. inside the device, the applied voltage is compared with a high-power 3.3V.
- The entered sequence number will be sent to the ADC and after it, it will be sent reverse with the reading value, this ensures that the measured value is always up-to-date.
- The USB-ADC accuracy is until 12 bit
- Valid temperature range -20° to +80° C

18. USB-Ampel / USB-WatchLight

The USB-Ampel is a simple but very effective signal device that is controlled by the PC. It looks like a traffic light with three light areas in red, yellow and green. The light areas consist of seven superbright LED with about 200 mcd each.

The size of the USB-Ampel is about 40 x 90 x 23 mm. The device must be operated in inner rooms only and should be protected against humidity. The permissible operating temperature range is -20° - +80° Celsius. The connection to the PC is done by a standard 1.8 m USB cable.

The USB-Ampel could also be configred to operate as a watchdog. The name of the device is USB-WatchLight in this case and when started the red light is turned on. In any state only one light is turned on and the two others a turned off. The configuration is done with the device configuration available with ClewareControl.

When a life signal (CalmWatchdog) is received, the green light is turned on. With the life signal, two arguments are supplied to the device. The first argument defines the time after which the red light is turned on. The second argument is the time for the yellow light. In opposite to the other Cleware watchdogs, the times for the USB-WatchLight are defined in seconds.

19. USB-MiniTrafficLight

The USB-MiniTrafficLight is a good looking
lighting device. The height of the USB device is
about 260 mm, the light housing about 60 x 70 mm.
Every color may be switched independently.
The The operating environment is limited to
indoor only at 0° bis 60°C.

A lot of applications could be realized with
this device:

- **-** indicate **talking readiness** in large business
   environments or sales floors.
- **-** indicate **test condition** in test fields
- **-** **visualize** the status of **temperature** or humidity
   in computing centers
- **-** show the employees the end of working time
- **-** indicate **help needed**
- **-** optical **admission control**
- **-** show the stock of products
- **-** easy understandable time out indicator for children
- **-** just indicate an optical condition
- **-** or just a nice **Gadget** or **present**

The upcoming new version 4.0.0 of our software eases the use of the traffic light devices.

20. USB-Contact

The contact sensor USB-Contact supplies a 5 V output which could be connected to a switch or a floating relais contact. The output is accessible through a 3,5 mm momo jack. The state of the contact is reported over the USB connection to the PC. The application ClewareControl is able to start actions depending of the state of the contact.

The size of the sensor is about 44 x 30 x 23 mm and it is connected to the PC using an approx. 1,8 m USB cable. The contact applies with 5 V and less than 0.1 mA. The product is guarranteed for 4 years. The valid temperature range for the USB-Contact is -0° to +80°C. Using the sensor outside this range may destroy it.

Typical applications are smoke sensors with a floating relais outlet, foot switches or reed contacts at doors or windows. Using ClewareControl, an email could be send if smoke was detected.