

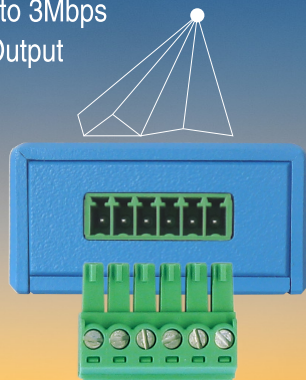
ISO485-BOX

Isolated USB to RS422/485 Converter



ISOLATED

2-Channel up to 3Mbps with 5V aux. Output



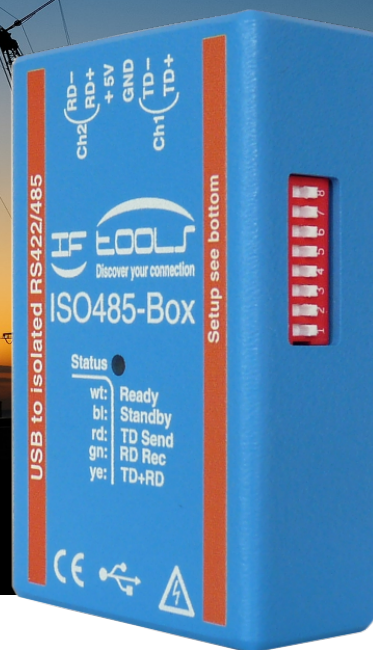
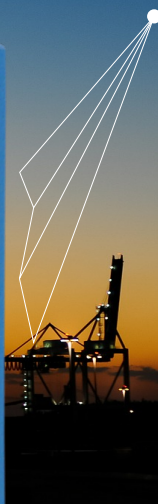
INFORMATIVE

A multicolor LED shows what's going on



FLEXIBLE

Easy adaption to all bus working modes



isolating • flexible • safe

The universal isolating converter

Ready for your application

The IFTOOLS ISO485-Box USB to RS422/RS485 converter has a variety of adjustment possibilities available to meet all requirements of your field-bus application. All the working modes and termination resistors can be easily set through lateral slide switches.

Robust and reliable

By its high isolating strength it is especially recommended for critical environments with potential shift and decouples the controlling components from the system bus.

A robust housing and pluggable screw terminals complement the converter's universal operational capability.

Informative

The display of the device status and of the fieldbus communication is indicated with one single multi-color LED. Transferred data are displayed extended so that even a single data byte at high data rate can be clearly identified.

Includes terminal program CleverTerm

CleverTerm is a free terminal program for the serial communication and provides everything you need to contact a field-bus device through the ISO485-Box. CleverTerm supports baud rates in the range from 300 to 1Mbps, even non-standardized. Also 1.5Mbps, 2Mbps and 3Mbps. It is expandable by own send dialogs and offers an Modbus ASCII / RTU master request simulation.

Product Features

- Various adaptations to all bus working modes
- High isolation capacity
- Switchable termination and rest level bias resistors
- Data rate up to 3Mbps, additional attenuation settable
- Support of non-standard bit rates
- Status display with multi-color LED
- 5V auxiliary output
- Rugged housing with pluggable screw terminals
- Made in Germany, Three years warranty
- Includes the CleverTerm terminal program and Lua scripting software

Run it on your favorite OS - It's your choice!
Supports Windows and Linux



Scan/click for this leaflet



Scan/click for CleverTerm





Windows

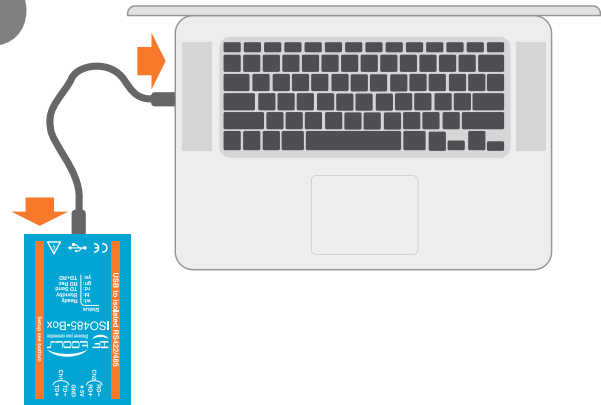
1

Installation via internet

1. Connect to the Internet.
2. Close all open applications.
3. Connect the ISO485-Box. **1**
4. Windows 7,8/8.1, 10
The ISO485-Box driver is downloaded automatically.
If your computer is NOT connected to the Internet, run the setup program from the installation USB stick.
5. Further tools on www.iftools.com/download

Installation via setup program

1. Disconnect the ISO485-Box.
2. Insert the IFTOOLS USB stick. **2**
3. Open the USB stick drive folder.
4. Start (double-click) the setup program.
5. Select the Driver & Tools section.
6. Install the appropriate driver.
7. Optionally select the Utilities section.
8. Install the appropriate program(s).



2



Linux

3

Driver is supported by kernel

1. Disconnect all other USB to Serial converters
2. Connect the ISO485-Box. **1**
The driver module is loaded automatically by the kernel.
3. Check your device permissions. **3**
Your user account must be group member of the device group, usually dialout or uccp.

Optional software installation

1. Insert the IFTOOLS USB stick. **2**
2. Allow software execution or click drive icon
3. Select the Utilities section.
4. Install the appropriate program(s).
5. Alternatively go to www.iftools.com/download

```

~$ ls -l /dev/ttyUSB*
crw-rw— 1 root dialout 188, 0 Sep 27 09:57 /dev/ttyUSB0
crw-rw— 1 root dialout 188, 1 Sep 27 11:48 /dev/ttyUSB1
~$ groups
YOUR_USER_NAME cdrom sudo dip plugdev lpadmin sambashare
~$ sudo addgroup YOUR_USER_NAME dialout
  
```

1. Open a terminal
2. Input: `ls -l /dev/ttyUSB*`
3. Read the group of the listed device(s), here `dialout`
4. Check your group member ships by input: `groups`
5. If your are not member of the device group, input:
`sudo addgroup YOUR_USER_NAME dialout`
6. Logout and login and check your groups again

Isolated USB to RS422/485 Converter

Bus-System and operating modes

The ISO485-Box Converter is suitable for all operating modes and can be easily adapted through slide switches.

Half-Duplex-Mode (HDX)

In Half-Duplex-Mode (HDX) or 2-wire mode the send and receive channels are internally connected, so that sending and receiving can take place only alternatingly. The bus is connected at channel 1 while channel 2 is unused.

Full-Duplex-Mode FDX

In Full-Duplex-Mode (FDX) or 4-wire mode characters are sent through channel 1 and received from channel 2.

The condition of the send driver in FDX mode while no data is just sent determines the following further operating modes.

FDX with Point-To-Point Mode (PTP)

If the sender stays active the bus is permanently occupied and set to idle level, the noise immunity is significantly increased.

This Point-To-Point mode (PTP), sometimes called RS422 mode, is suitable for all systems with one fixed sender (master) and one or more receivers.

FDX with Multipoint Mode (MPT)

For systems with multiple alternating senders the bus must become inactive when no data is transferred. This is mandatory for all applications where more than one master demands access to the other bus participants.

In addition you can use this mode if you need to form a 2-wire HDX transfer with external connection between send and receive channel in special applications.



Connecting the ground line to all bus participants increases the noise immunity significantly as equalizing currents do not have to flow off the data lines.

Bus Resistors

Bus resistors for termination and bias (pull-up/down) can be set independently for each channel.

In Half-Duplex-Mode (HDX) channel 2 is unused for data transfer, nevertheless its resistors can be used to terminate another bus system.

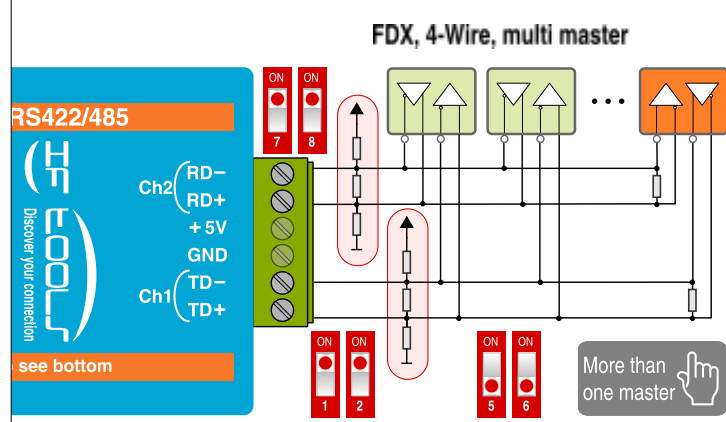
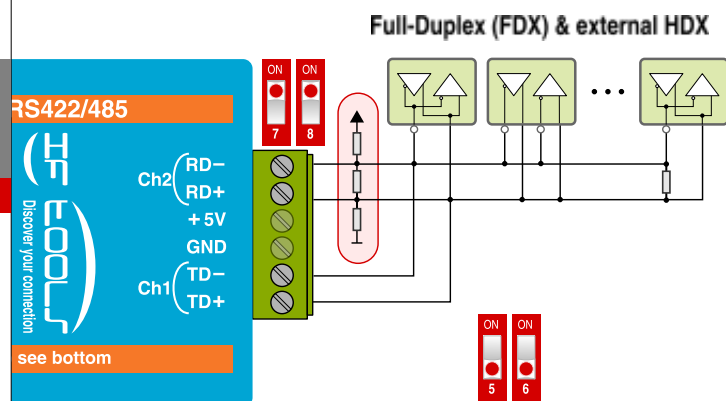
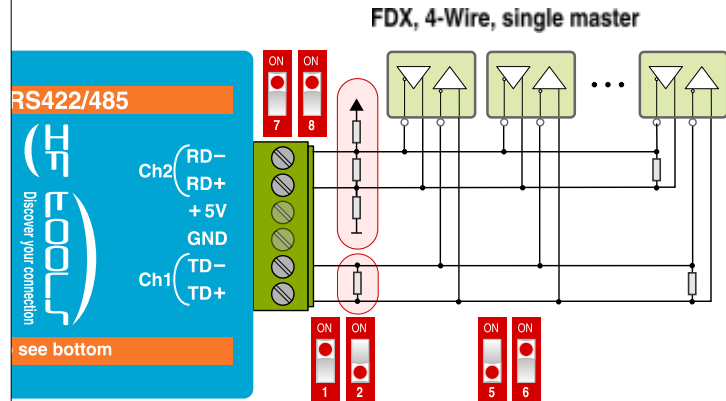
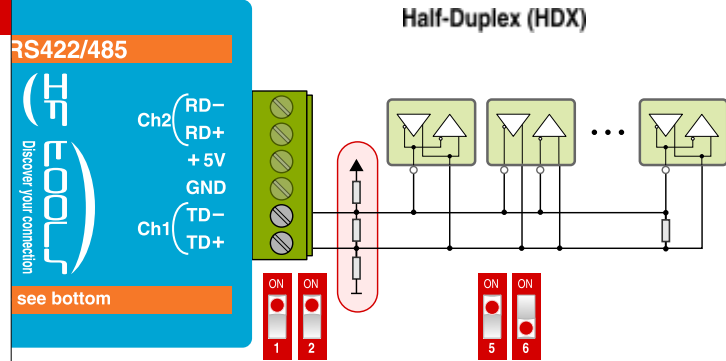
Termination resistors

120Ω termination resistors at both bus ends (parallel sum 60Ω) are used to attenuate the there interfering reflected data signals.

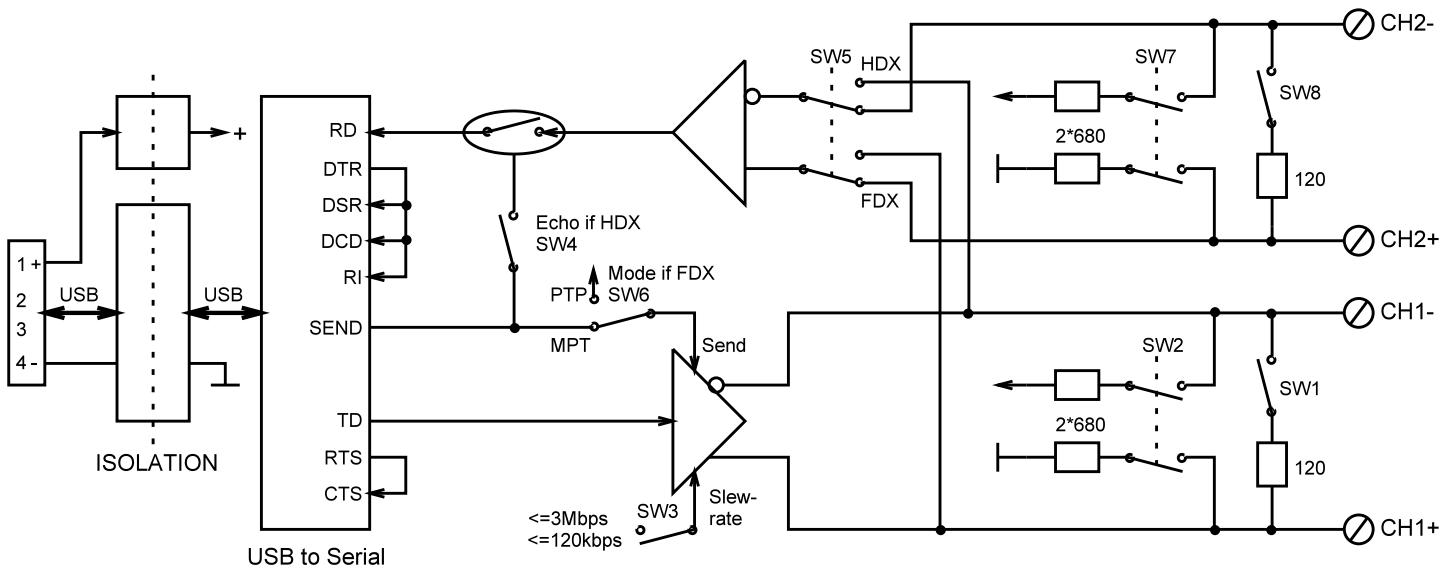
Without termination resistors, signal reflections off the unterminated end of the cable can cause data corruption.

Bias (pull-up/down) resistors

In Multipoint (MPT) operation mode, unparallel pull-up to +5V and pull-down to ground resistors of 680Ω each in connection with correct 60Ω termination are recommended. This sets the bus rest level to about +200mV, which can be correctly recognized as idle level "1" while the data transfer is inactive.



IFTOOLS ISO485-Box functional schematic - switches are shown in the off (down) position



No	Function	Up (ON)	Down (OFF)
8	Termination channel Ch2	120Ω resistor	No resistor
7	Bus rest level setting channel Ch2	2 x 680Ω Pull up/down (biasing)	No setting (floating)
6	Bus level, sender enable in FDX mode	Point-To-Point, permanent	Multipoint, switched
5	Data transmission mode	Half Duplex at Ch1	Full Duplex, Ch1: TD, Ch2: RD
4	Send echo in HDX mode	Allow Echo	Suppress Echo
3	Limiting switching edges, bit rate	Up to 3Mbps	Up to 120 kbps
2	Bus rest level setting channel Ch1	2 x 680Ω Pull up/down (biasing)	No setting (floating)
1	Termination channel Ch1	120Ω resistor	No resistor

+1 Auxiliary Voltage

An isolated auxiliary voltage of +5V can be used for the supply of external devices or for special bus terminations. The output is short-circuit proof but connected to the secondary side. If the load is too high it might have influence on the bus functionality.

+2 Limitable data rate

One particular feature of the ISO485 converter is the capability to reduce the data rate and therewith the speed of the switching edges of the send driver. This attenuation decreases the harmonics on the data lines, reduces the radiated interfering fields and leads to a more quiet and safe operation at lower transmission rates.

+3 Send Echo

In Half-Duplex-Mode (HDX) receiver and sender are directly connected (echo). According to the used data protocol this can be interpreted either correct as send acknowledgement or erroneous as not awaited receive data. The ISO485 converter provides the facility to allow or suppress the send echo according to your needs.

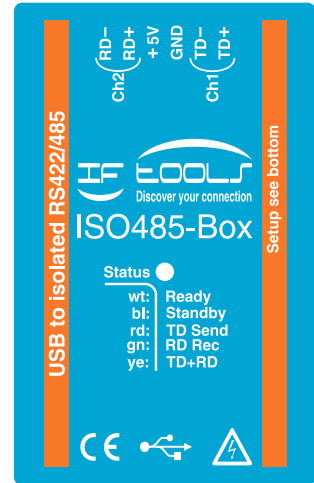
LED	Device Status
OFF	No transfer, switching to device status display
WHITE	Device Idle (ready)
BLUE	Standby, Energy saving Mode
Data transfer direction	
RED	Data Send (TD)
GREEN	Data Receive (RD)
YELLOW	Send and Receive (TD+RD)



Transferred data are displayed extended so that even a single data byte at high data rate can be clearly identified. As soon as no data transfer takes place for about three seconds the display switches to the indication of the device status.

Device Status Display

The device status and the fieldbus communication is indicated with one single multi-color LED.



More tools on stick for:

communicating
testing
developing
logging



"Everything you need for a first contact to a bus device connected through the ISO485-Box."

Luactb

A stand-alone Lua interpreter with integrated serial port access.
Single executable file < 800kB.
Easy writing and automation of test scripts and test applications.
Simulating of complex transmissions.
Integrated support for Modbus ASCII and RTU.

CleverTerm

The clever terminal program for serial port and field-bus communication.
Build your own sending dialogs and create customized user interfaces.
Simulate field-bus telegrams.
Play Modbus ASCII/RTU master with predefined Modbus function dialogs.
CleverTerm supports all baud rates in the range from 300 to 1Mbps, even non-standardized. Also higher rates of 1.5Mbps, 2Mbps and 3Mbps.

Scan/click for tools



Run it on your favorite OS

```

Luactb Terminal
Lua 5.1.4 Copyright (C) 1994-2008 Lua.org, PUC-Rio, extended by IFTOOLS
> for v,k in pairs( ctb.ListPorts() ) do print( k ) end
COM1 : @msports.inf,%std%;(Standard port types) FREE
COM3 403:6001 @oem6.inf,%ftdi%;FTDI A103MFIC FREE
COM4 403:6001 @oem6.inf,%ftdi%;FTDI 5&35f564 FREE
> com = SerialPort.new()
> com:Open( "COM3", 19200 )
> com:Write( "\002Data between STX and ETX\003" )
> timeout = 5.0
> answer = com:GetLine( "\003", timeout )
> com:Close()

Lua Script Dialog
Select your dialog
modbus.lua
Mode:
  [ ] ASCII [x] RTU
Address: 2
Function: Write Single Coil (5)
Output Address: 1
Output Value: 0xFF00
[Close] [Execute]
    
```

Isolated USB to RS422/485 Converter

RS422/485 field-bus

Data rates	Standard bit rates 300 up to 1Mbps, also unusual baud rates either by Software or baud rate aliasing. Also higher rates of 1.5Mbps, 2Mbps and 3Mbps.
Data format	Provides 5, 6, 7 or 8 Data Bits, 1 or 2 Stop Bits and Parities Odd, Even, Mark, Space, None.
Handshake	Feed back of the signals RTS/CTS and DTR/DSR in input and output for protocol simulation.
RS422/485 Signals	TD, RD according to the RS485 Standard, $\pm 15kV$ ESD, $\pm 5V$ difference voltage.
Connector	6pin plug connector with screw terminals. Type Phoenix MC156ST381.
Auxiliary voltage	Auxiliary secondary voltage output 5V/200mA to supply external devices or special bus terminations. Short-circuit proof, connected to the RS485 supply.

USB PC Side

Connector	USB Type B socket for PC connection and power supply.
USB compatibility	Compatible to USB 1.1/2.0. Absolutely functional with all USB-Interfaces of old and new PCs.

Special features

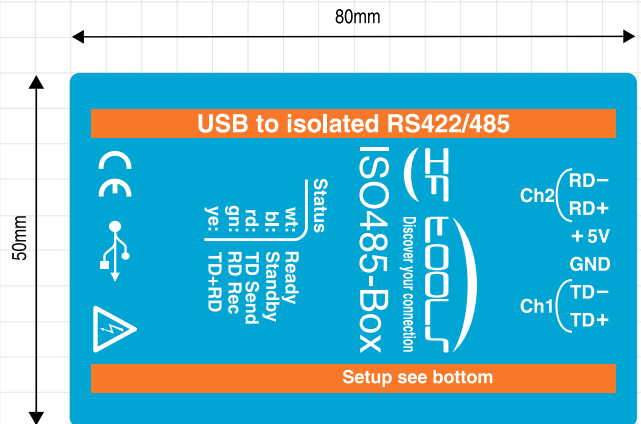
Isolation	Isolation strength 2KVdc 1 second.
Chipset	FTDI FT232R: Additional functions for high transmission safety, internal data buffer 384 bytes (input 128 bytes, output 256 bytes).
Status display	Display of the device status and fieldbus communication with one single multi-color LED. Extended display of transferred data to indicate even a single data byte at high data rate.

Supported OS & drivers

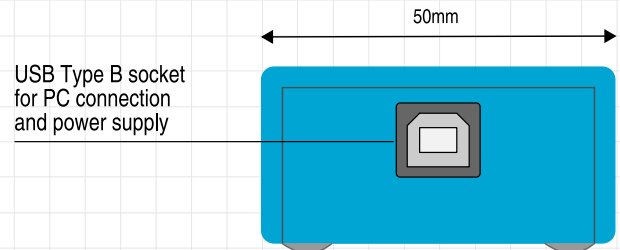
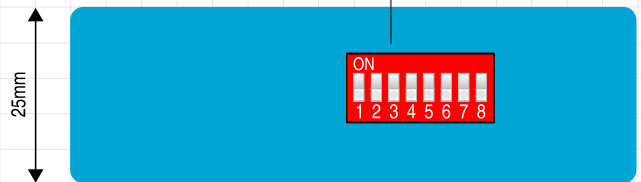
Windows	Windows 10, 8/8.1, Windows 7, Vista, Windows XP, (32 and 64 bit, all with Microsoft certified driver).
Linux	Kernel 2.4.x or higher, needed driver (ftdi_sio module) is part of all newer kernels.
Driver access	Via virtual com-ports or USB direct drivers for own applications. Windows: Accessing via COMx, Linux: Device access via /dev/ttyUSBx.

What you get

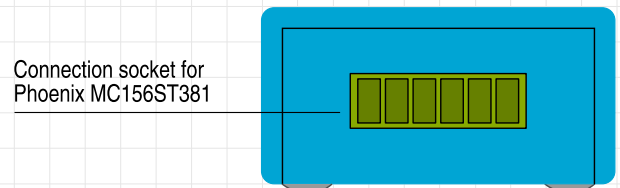
Content	USB to RS422/485 converter ISO485-BOX. USB connection cable about 1.8m. Phoenix 6 pin connector with screw terminals. Miniature screw driver. USB stick with drivers (Windows), terminal program. CleverTerm and further tools.
Warranty	Made in Germany, 3 years warranty and free product lifetime updates for drivers and software tools.



External dip switches to easily setup all operating modes

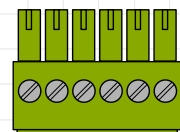


USB Type B socket for PC connection and power supply



Connection socket for Phoenix MC156ST381

6-pin Phoenix screw connector MC156ST381 for easy adaptable bus connection



To the shop scan/click



Available on our
Online Shop

Price: 129 €
without tax