W&T

www.WuT.de

Manual

Installation, Startup and Application

RS232 Isolators

valid for:

#88001: RS232 Isolator 1kV
#88004: RS232 Isolator 4kV
#88050: RS232 Isolator 50kV
#11573: Adapter set for RS232 isolators

Release 10/2019

Subject to errors and changes:

Since we can make mistakes, none of our statements should be used without checking. Please let us know of any mistakes or misunderstandings you are aware of, so that we can recognize and eliminate them quickly.

Perform work on and with W&T products only as described here and only if you have read and understood the manual fully. Unauthorized use can result in hazards. We are not liable for the consequences of unauthorized use. When in doubt, check with us or consult you dealer!

Differences in potential between RS232 devices connected to each other are frequently the cause of erroneous data transmission and failed interface components.

Wiesemann & Theis offers a whole family of galvanic isolators for data lines to prevent compensation currents from flowing over the signal lines when there are potential differences between the devices.

The RS232 Isolator family is described together with their technical specifications and wiring examples on the following pages.

For up-to-date information on new developments, see our Internet site at http://www.wut.de or check the e-mail short notices at the W&T Interface Club, which you can also subscribe to from the W&T Homepage.

Index

Legal Notices

Warning note concept

This manual contains notes which must be observed for your personal safety and to prevent equipment damage. The notes are called out with a warning triangle. Depending on the hazard level the warning notes are represented in decreasing order of hazard as follows:

⚠ DANGER

Indicates a hazard which will result in death or serious injury if no appropriate safety measures are taken.

⚠ WARNING

Indicates a hazard which can result in death or serious injury if no appropriate safety measures are taken.

⚠ CAUTION

Indicates a hazard which can result in slight injury if no appropriate safety measures are taken.

⚠ NOTE

Indicates a hazard which can result in equipment damage if no appropriate safety measures are taken.

When multiple hazard levels are present the warning note for the highest level is used. If the warning triangle for personal injury is used, then a warning for equipment damage may also be added in the same warning note.

Qualified personnel

The product described in this manual may be installed and placed in operation only by personnel who are qualified for the respective task.

In addition the documentation for the respective task must be followed, especially the safety and warning notes included in it.

Qualified personnel have received training and experience which enable them to recognize risks associated with handling the described products and to avoid possible hazards.

Disposal

Electronic devices may not be disposed of with household waste, but rather be brought to a proper electronics waste disposal facility.

A complete Declaration of Conformity for the described devices can be found on the respective datasheet pages on the W&T Homepage at http://www.wut.de.

Safety Instructions

General precautions

⚠ CAUTION

This manual is intended for the installer of the described galvanic isolators and must be read and understood before beginning any work.

The RS232 isolators are to be installed and placed in service only by an electrical specialist.

Intended use

⚠ CAUTION

The intended use of the RS232 isolators is the use in accordance with the information provided in the manual.

The devices may be operated only using the maximum permitted connection values according to the technical data. Any other use or modification is considered to be improper.

Installation

⚠ CAUTION

Before beginning any work on the devices, the power supply of the devices to be connected via the RS232 isolators must be completely disconnected by suitable measures. Make sure that the devices cannot be turned on again accidentally!

Please do not install the galvanic isolators in places with high moisture or near water.

Please do not install the devices in places with high ambient temperature or near heat sources. Please refer to the specification of the maximum ambient temperature.

Electrical Safety

⚠ DANGER

Both ports of all W&T RS232 isolators are isolated from each other with a dielectric strength of 1kV, 4kV or 50kV DC.

This allow the RS232 isolators to suppress compensation currents which can flow as a result of potential differences between the connected devices when directly copper connections are used. Such currents can cause interference with data transmission or even destroy the interfaces.

The galvanic isolation of the RS232 isolators described in this manual are designed for protecting the serial ports and for ensuring noise-free data transmission in noisy environments. Use of the devices to protect persons against contact with hazardous voltages is not permitted. For safety-critical galvanic isolation, please contact us.

Make sure that there is enough space between the cables leading to the serial ports of the RS232 isolators to avoid any potential flashovers between the cables.

Protection of operating personnel and the equipment is only assured if the devices are used according to its intended purpose. Any other use than described in the manuals may compromise the safety and function of the RS232 isolators and the connected systems.

If a fault is unable to be eliminated, the devices must be taken out of service and protected against accidental startup.

Responsibility for adhering to the local prevailing safety regulations lies with the operator.

EMC

⚠ NOTE

All W&T RS232 isolators meet the limits for noise immunity in industrial environments as well as emissions in commercial and residential areas, so that use of these converters is not subject to any EMC based restrictions.

To ensure compliance with the EMC standards, shielded signal cables must be used.

If the RS232 isolator is part of an integrated solution, the installer must ensure that the entire system complies with the EMC guidelines.

RS232 Isolator 1kV, Model 88001

The Isolator model 88001 galvanically isolates two RS232 devices from each other with an isolation voltage of 1kV DC. It must be inserted into the data line between these devices.

Function

One channel in each direction is provided which may be used only for the data lines TxD and RxD but not for the handshake lines (DTR, RTS, etc.). The two lines must always be connected on both ends, even if data transmission is only in one direction.

Galvanic isolation of the signals is implemented using optocouplers. The RS232 drivers and receivers are powered from the connected peripheral devices; no external power supply is required.

When installing you must ensure that the data cables are sufficiently far enough away from each other to prevent flashover.

In the event of a problem check first whether the connection works without the isolator by connecting only a 3-conductor cable (TxD, RxD, GND) between the two RS232 devices.

The lower baud rate limit of the 88001 Isolator of 300 baud depends on the output voltage of the connected interface. At very low baud rates and unclear interface conditions you should switch to the static operating model 88004 or the externally powered 1kV Isolator model 88205.

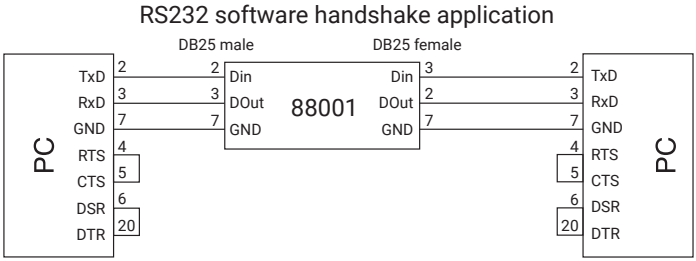
Connectors

Both interfaces of the W&T RS232 Isolator model 88001 are implemented as 25-pin SUB_D connectors. By using the adapter set model 11573 you can easily connect the isolator to 9-pin terminals with PC configuration. A description of the adapter set can be found later in this manual.The function of the isolator connection pins can be found in the following table and on the sticker located on the device itself.

DB25 male connector	
Pin#	RS232 signal
2	data in
3	data out
7	signal GND

DB25 female connector	
Pin#	RS232 signal
2	data out
3	data in
7	signal GND

Wiring example:



Technical Data

Baudrate:	300..19200 baud
Data format:	any data format
Supported signals:	RxD, TxD
Isolation:	min. 1.000 volts DC
Supply voltage:	no external power supply required
Input impedance:	> 470 Ohm
RS232 interfaces:	DB25 male connector, DCE pin assignment DB25 female connector, DTE pin assignment
Ambient temperature:	Storage: -40..+70°C Operation: 0..+50°C
Relative humidity:	5..95% RH (non-condensing)
Housing:	plastic mini-housing,
Dimensions:	63 mm x 54 mm x 16 mm
Weight:	approx. 50 g
Scope of delivery:	1x RS232 Isolator, model 88001 1x Gender Changer 25F-25F

RS232 Isolator 4kV, Model 88004

The Isolator model 88004 galvanically isolates two RS232 devices from each other with an isolation voltage of 4kV DC. It must be inserted into the data line between these devices.

Function

One data channel and 2 handshake channels in each direction are provided. To ensure a stable energy supply to the isolator at least as many signal inputs should be connected to the isolator as there are outputs available.

Galvanic isolation of the signals is implemented using optocouplers. The RS232 drivers and receivers are powered from the connected peripheral devices; no external power supply is required.

When installing you must ensure that the data cables are sufficiently far enough away from each other to prevent flashover.

In the event of a problem check first whether the connection works without the isolator by connecting the two RS232 devices directly without the RS232 isolator.

Connectors

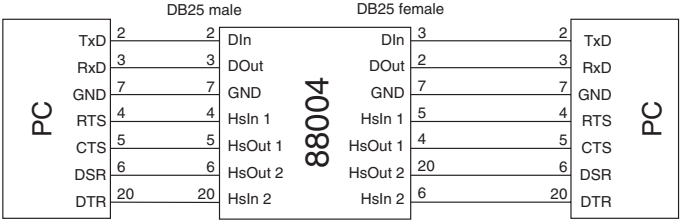
Both interfaces of the W&T RS232 Isolator model 88004 are implemented as 25-pin SUB-D connectors. By using the adapterset model 11573 you can easily connect the isolator to 9-pin terminals with PC configuration. A description of the adapter set can be found later in this manual.The function of the isolator connection pins can be found in the following table and on the sticker located on the device itself.

DB25 male connector	
Pin#	RS232 signal
2	data in
3	data out
4	handshake in 1
5	handshake out 1
6	handshake out 2
7	signal GND
20	handshake in 2

DB25 female connector	
Pin#	RS232 signal
2	data out
3	data in
4	handshake out 1
5	handshake in 1
6	handshake in 2
7	signal GND
20	handshake out 2

Wiring example:

RS232 hardware handshake application



Technical Data

Baud rate:	0..115200 Baud
Data format:	any data format
Supported signals:	RxD, TxD, RTS, CTS, DSR, DTR
Galvanic isolation:	min. 4kV DC isolation voltage
Creepage and clearance distances:	> 7mm
Supply voltage:	no external power supply required
Input impedance:	> 1000 Ohm
RS232 interfaces:	DB25 male, DCE configuration DB25 female, DTE configuration
Ambient temperature:	Storage: -40..+70°C Operation: 0..+50°C
Relative humidity:	5..95% RH (non-condensing)
Housing:	plastic mini-housing,
Dimensions:	63 mm x 54 mm x 16 mm
Weight:	approx. 50 g
Scope of delivery:	1x RS232 Isolator, Model 88004 1x Gender Changer 25F-25F

RS232 Isolator 50kV, Model 88050

The Isolator model 88050 galvanically isolates two RS232 devices from each other with an isolation voltage of 50kV DC. It must be inserted into the data line between these devices.

Function

One channel in each direction is provided which may be used only for the data lines TxD and RxD but not for the hand-shake lines (DTR, RTS, etc.). The two lines must always be connected on both ends, even if data transmission is only in one direction.

Galvanic isolation of the signals is implemented using a 100 mm long fiber optic cable. The RS232 drivers and receivers are powered from the connected peripheral devices; no external power supply is required.

When installing you must ensure that the data cables are sufficiently far enough away from each other (min. 100 mm) to prevent flashover.

In the event of a problem check first whether the connection works without the isolator by connecting only a 3-conductor cable (TxD, RxD, GND) between the two RS232 devices.

The lower baud rate limit of the 88050 Isolator of 300 baud depends on the output voltage of the connected interface.

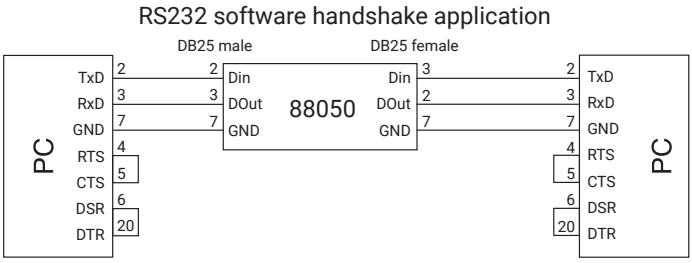
Connectors

Both interfaces of the W&T RS232 Isolator model 88050 are implemented as 25-pin SUB-D connectors. By using the adapterset model 11573 you can easily connect the isolator to 9-pin terminals with PC configuration. A description of the adapter set can be found later in this manual.The function of the isolator connection pins can be found in the following table and on the sticker located on the device itself.

DB25 male connector	
Pin#	RS232 signal
2	data in
3	data out
7	signal GND

DB25 female connector	
Pin#	RS232 signal
2	data out
3	data in
7	signal GND

Wiring example:



Technical Data

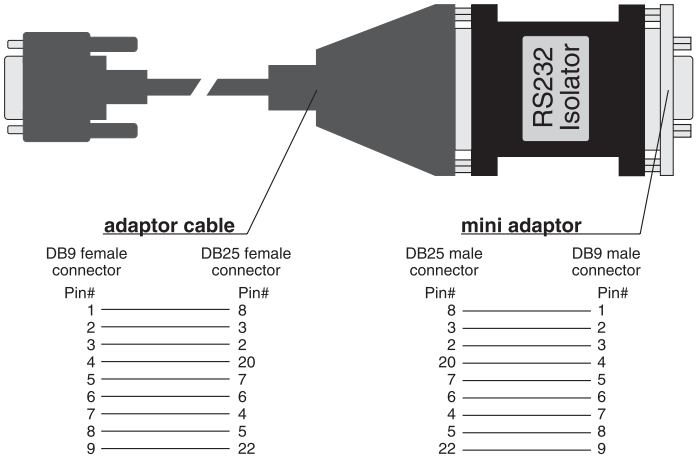
Baud rate:	300..19200 baud
Data format:	any data format
Supported signals:	RxD, TxD
Galvanic isolation:	min. 50 kV DC isolation voltage
Creepage and clearance distances:	> 95 mm
Supply voltage:	No external power supply required
Input impedance:	> 330 Ohm
RS232 interfaces:	DB25 male with 2m cable, DCE configuration DB25 female with 2m cable, DTE configuration
Ambient temperature:	Storage: -40..+70°C Operation: 0..+50°C
Relative humidity:	5..95% RH (non-condensing)
Housing:	Plastic mini-housing
Dimensions:	250 mm x 20 mm dia.
Weight:	approx. 340 g
Scope of delivery:	1x RS232 Isolator, model 88050 1x Gender Changer 25F-25F

Adapter set for RS232 Isolators, Model 11573

Function

The Model 11573 Adapter Set consists of a 15 cm long connection cable with 9-pin SUB-D female and 25-pin SUB-D male as well as a mini-adapter with 25-pin SUB-D feamle and 9-pin SUB-D male.

In order to incorporate the model 88001, 88004 and 88050 isolators into a 9-pin connection, the adapters are connected to the two RS232 interfaces of the isolators. The mechanical arrangement as well as the pinout of the adapter can be seen in the following diagram:



By using the short adapter cable the isolators can be connected directly to 9-pin serial devices having a SUB-D male with standard PC configuration.

Wiesemann & Theis GmbH
Porschestr. 12
42279 Wuppertal / Germany

Mail info@WuT.de
Web www.WuT.de

Tel. +49 (0) 202/2680-110
Fax +49 (0) 202/2680-265