LD232

RS232 serial port extension kit

up to 1200 m with galvanic isolation

LD232

Datasheet

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CONTENT

ABOUT DEVICE

A pair of LD232A and LD232B modules have been designed to allow the RS232 serial port length to be extended up to 1200 metres. Both modules are equipped with galvanic isolation and surge protection on the interconnecting line, ensuring safe and reliable data transfers over longer distances.

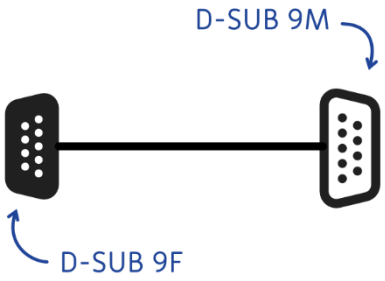

fig. 1 - standard RS232 cable can be only a few tens of meters long

In reality, the maximum usable length of an RS232 cable ranges from a few meters to several tens of meters. Longer distances cause signal degradation and communication errors.

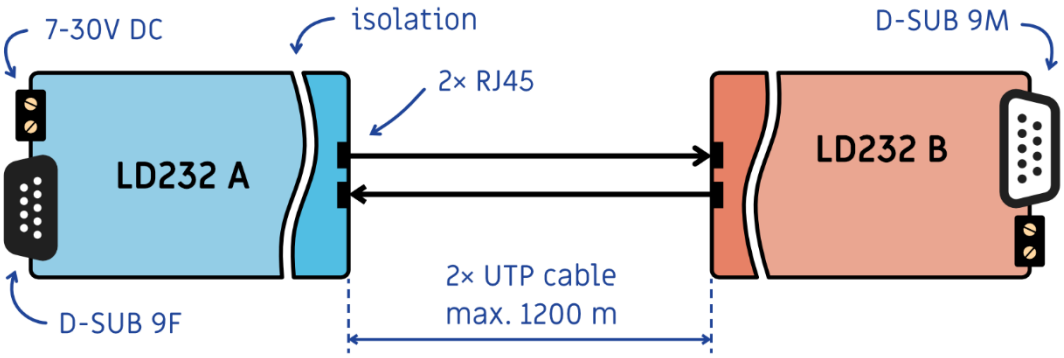

fig. 2 - when extended via the LD232 kit, the RS232 port can be extended to a long distance

The RS232 serial port from the computer (or another device) is connected to LD232 A. In module A, the signals are galvanically isolated and transferred to the remote module B using two UTP cables. One pair of RS422 line wires is used to transmit each signal, which is very resistant to interference and can be up to 1200 meters long. Galvanic isolation of the signals is also in Module B. The RS232 line signals on module B are the same as the input signals of module A.

Features

- Transmit all RS232 line signals over distances up to 1200 m. Connected devices are not affected by the insertion of modules, no software modification is required.
- Galvanic isolation of the RS232 input and output lines from the transmission line.
- Baud rate up to 480 kBd.
- Transmission line surge protection.
- Wide range of supply voltage options (various options covering the range of 4.5 to 75 V).
- Power and communication indicators, no configuration controls.

Surge protection

The LD232 kit also protects both terminal devices from overvoltage and prevents creation of a ground loop. However, the modules need to be protected against overvoltage from the RS232 communication line.

Each module therefore contains two 6.8 V transils on each line. The transmission line is completely galvanically isolated from RS232 on module A as well as on module B.

CONNECTING

LD232A module

Connect the LD232A module to the RS232 serial line on the PC (or other device with a matching connector) with a 1:1 un-crossed cable. The table shows the cable connections for the D-SUB 25 and D-SUB 9 connectors.

RS232 D-SUB 9	RS232 D-SUB 25	LD232A D-SUB 9	Signal marking
3	2	3	TxD
2	3	2	RxD
7	4	7	RTS
8	5	8	CTS
6	6	6	DSR
4	20	4	DTR
1	8	1	DCD
5	7	5	GND

LD232B module

The D-SUB 9 connector on the LD232B module is electrically identical to the connector on the PC when module A and B are properly connected. For completeness the wiring is shown in the table. To connect this connector to e.g. a controlled device, use the same cable as for direct connection to the PC.

LD232B D-SUB 9	Signal marking
3	TxD
2	RxD
7	RTS
8	CTS
6	DSR
4	DTR
1	DCD
5	GND

LD232A and LD232B interconnection

The modules are interconnected by two eight-core wires. We recommend using a common cable used for computer network distribution - the so-called UTP cable. For connecting the two modules are used RJ45 connectors marked as UTP 1 and UTP 2.

fig. 3 - connectors UTP 1 and UTP 2

Signals that do not need to be transferred do not need to be interconnected. For the transmission, the electrical standard known from the RS422 line is used, therefore a pair of wires is needed for each signal. The correct cable design is one twisted pair for each signal to be transmitted (marked as + and - in the table). The cable is uncrossed, 1:1 according to the table.

LD232A RJ45 – 1	LD232B RJ45 – 1	Signal
1	1	TxD+
2	2	TxD-
3	3	RTS+
4	4	RxD+
5	5	RxD-
6	6	RTS-
7	7	CTS+
8	8	CTS-
LD232A RJ45 – 2	**LD232B RJ45 – 2**	**Signal**
1	1	DTR+
2	2	DTR-
3	3	RI+
4	4	DSR+
5	5	DSR-
6	6	RI-
7	7	DCD+
8	8	DCD-

TECHNICAL PARAMETERS

Transmission line:

Type.....differential, RS422

Connector.....2 × RJ45

RS232:

RS232 on module A .....D-SUB 9F (socket)

RS232 on module B .....D-SUB 9M (plug)

Transmitted signals .....complete RS232 line (TxD, RxD, RTS, CTS, DTR, RI, DSR, DCD)

Baud rate.....max. 480 kBd

General:

Power .....7 V to 3 0V (optional 4.5 – 75 V) with reverse polarity protection

Power connector.....terminal block

Degree of protection .....IP 30

Operating temperature.....-10 °C to +70 °C

Operating humidity .....max. 90 %, non-condensing

Dimensions.....120 × 55 × 24 mm

Weight .....130 g (one module)

Variants

Mount

- Without mount *(standard version)*
- DIN rail mount

Power

- 7 to 30 V [1] *(standard version)*
- 5 V ±10% [1,2]
- 4.5 to 9.0 V [2,3]
- 9 to 18 V [2,3]
- 18 to 36 V [2,3]
- 36 to 75 V [2,3]

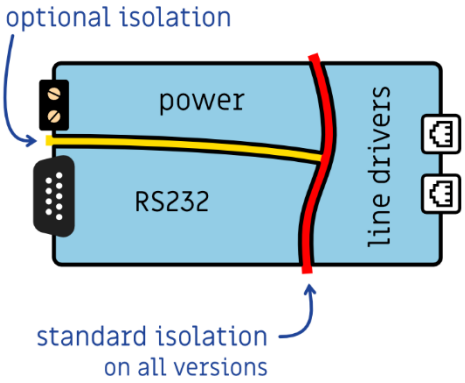

fig. 4 – variants of galvanic isolation: red standard, yellow optional

Please do not hesitate to contact us if you have any further specific requirements for the design and functionality of LD232 module.

[1] **Complete galvanic isolation** (including ground) of the transmission line from the RS232 and power supply ("standard isolation" in fig. 4). The RS232 line ground is galvanically connected to the power supply ground.

[2] Delivery time for this version is one to three weeks.

[3] In addition, the RS232 line ground is galvanically isolated from the power supply ground ("optional isolation" in fig. 4).

Papouch s.r.o.

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