

User manual

CONVERTER MODULE

SRS-2/4-Z16-B1a

- Input type: RS-232 / RS-485 signals conversion
- Data logging function



Read the user's manual carefully before starting to use the unit or software.
Producer reserves the right to implement changes without prior notice.

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Explanation of symbols used in the manual:



- This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.

IF THE DEVICE IS NOT USED ACCORDING TO THE MANUAL THE USER IS RESPONSIBLE FOR POSSIBLE DAMAGES.



- This symbol denotes especially important characteristics of the unit. Read any information regarding this symbol carefully

1. BASIC REQUIREMENTS AND USER SAFETY



- **The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper environmental conditions and using the unit contrary to its assignment.**
- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- The unit must be properly set-up, according to the application. Incorrect configuration can cause defective operation, which can lead to unit damage or an accident.
- **If in the case of a unit malfunction there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.**
- Neighbouring and connected equipment must meet the appropriate standards and regulations concerning safety and be equipped with adequate overvoltage and interference filters.
- **Do not attempt to disassemble, repair or modify the unit yourself. The unit has no user serviceable parts. Defective units must be disconnected and submitted for repairs at an authorized service centre.**



- In order to minimize fire or electric shock hazard, the unit must be protected against atmospheric precipitation and excessive humidity.
- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gasses and oils.
- Do not use the unit in areas where there is risk of explosions.
- Do not use the unit in areas with significant temperature variations, exposure to condensation or ice.
- Do not use the unit in areas exposed to direct sunlight.
- Make sure that the ambient temperature (e.g. inside the control box) does not exceed the recommended values. In such cases forced cooling of the unit must be considered (e.g. by using a ventilator).



The unit is designed for operation in an industrial environment and must not be used in a household environment or similar.

2. GENERAL CHARACTERISTICS

Data logger (recorder) type **SRS-2/4-Z16-B1a** is multifunction device which can operate as:

- power supply for TRS system (with external power supply)
- RS232 / RS485 standard converter
- galvanic separator of RS232 and RS485 circuits,
- data logger

SRS-2/4-Z16-B1a is module with 2 processors equipped with lithium battery backedup RTC and FLASH memory to store data.

Main purposes for **SRS-2/4-Z16-B1a** are:

- connection of TRS system with PC host equipped with RS-232 interface.
- Automatic data logging while host power is turned off or **SimCorder Soft** is closed.

Data logger can be used in **TRS** measurement systems controlled exclusively by **SimCorder Soft** software, distributed by SIMEX.

Power supply

Power supply adaptor 12VDC is delivered with **SRS-2/4-Z16-B1a**. It's typical current load is 1.25A, so it allows to supply data logger and some number of measurement modules TRS-XX connected to the network. Maximum number of measurement modules depends on individual current consumption of particular modules.

Standard converter

Internal interface (RS 232 / RS 485 converter) is designed to MODBUS RTU protocol, with baud rate of 9600 bit/sec requirements (timing). RS 232 interface uses only TxD and RxD lines. Control of transmission direction with RTS signal is not required - it is fully automatic. Standard converter guarantee full galvanic isolation (opto-insulation) between RS 232 and RS 485 interfaces, and can works with any devices made by SIMEX, and equipped with RS 485 interface, it can also be used to ay other devices of MODBUS protocol with RS 485 interface and host PC computer equipped with RS 232 interface (exclusively with baud rate 9600 bit./sek.).



Device has it's own RS 232 data cable. Due to features of RS 232 standard this cable should not be prelonged.

Data logger (data buffer)

Device is equipped in 1Mbit of FLASH memory, which allows to record about 40 000 of measurements. Configuration of data logger is fully automatic, and is realised by **SimCorder Soft** software accordingly to actual program settings. While normal operation of **SimCorder Soft**, data buffer is fully transparent, all correct data transactions are transmitted to/from the network. Data logger functions are being activated while application closing, or after computer power off. Since this moment all measurements are stored in internal FLASH memory. After next run of **SimCorder Soft** all saved measurement data is transmitted to the host PC, and stored in database on PC computer, next data logger FLASH is cleared.

Maximum period of data logging depends on number and type of measurement modules, and time period between measurements. If data logger must works longer than this maximum period it's internal memory is overflowed, and newest measurement results will be lost.

EXAMPLE:

Assume that TRS system consist in four **TRS-01a** modules, and **SimCorder Soft** reads measurements every 1 minute. Maximum period of data logging (by data buffer with 1 Mb of FLASH) can be calculated according to formula:

$$\text{Max. period of data logging} = \frac{40000 \text{ measurements}}{4 \text{ devices}} \times 1 \text{ min.} = 10000 \text{ min.} \approx 1 \text{ week}$$

3. TECHNICAL DATA

Power supply voltage	12V DC
Current consumption	max.100mA (without measurement modules)
Supply output voltage	10.5 V ±5% DC
Current efficiency	max. 0.5 A
Galvanic separation	between RS 485 line and RS 232 interface.
RS 232 connector	1x 9 PIN Canon (RS232), cable (length about 1,3 m) is delivered with the unit
Transmission protocol	MODBUS RTU
Transmission parameters	9600/8/1/N
Data logger memory capacity	1 Mb (about 40 000 measurements)
Housing dimensions	150 x 70 x 68 mm
Weight	220 g
Operating temperature (depending on version)	0°C to +50°C or -20°C to +50°C
Storage temperature (depending on version)	-10°C to +70°C or -20°C to +70°C
Humidity	5 to 90% no condensation
Altitude	up to 2000 meters above sea level
Screws tightening max. torque	0,5 Nm
Max. connection leads diameter	2,5 mm ²
EMC	PN-EN 61326:2003



This is a class A unit. In housing or a similar area it can cause radio frequency interference. In such cases the user can be requested to use appropriate preventive measures.



Detailed informations about installation of TRS system user can find in:
“User manual for Temperature and Humidity Recording System”

4. DEVICE INSTALLATION

The unit has been designed and manufactured in a way assuring a high level of user safety and resistance to interference occurring in a typical industrial environment. In order to take full advantage of these characteristics installation of the unit must be conducted correctly and according to the local regulations.



- Read the basic safety requirements on page 3 prior to starting the installation.
- All installation works must be conducted with a disconnected power supply.
- The load must correspond to the requirements listed in the technical data.

4.1. UNPACKING

After removing the unit from the protective packaging, check for transportation damage. Any transportation damage must be immediately reported to the carrier. Also, write down the unit serial number on the housing and report the damage to the manufacturer.

Attached with the unit please find:

- user's manual for **SRS-2/4-Z16-B1a** unit (device)
- two resistors

4.2. CONNECTION METHOD

Caution



- Installation should be conducted by qualified personnel . During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- Wiring must meet appropriate standards and local regulations and laws.
- In order to secure against accidental short circuit the connection cables must be terminated with appropriate insulated cable tips.
- Tighten the clamping screws. The recommended tightening torque is 0.5 Nm. Loose screws can cause fire or defective operation. Over tightening can lead to damaging the connections inside the units and breaking the thread.
- In the case of the unit being fitted with separable clamps they should be inserted into appropriate connectors in the unit, even if they are not used for any connections.

Due to possible significant interference in industrial installations appropriate measures assuring correct operation of the unit must be applied. To avoid the unit of improper work keep recommendations listed below.

- Avoid common (parallel) leading of signal cables and transmission cables together with power supply cables and cables controlling induction loads (e.g. contactors). Such cables should cross at a right angle.
- Contactor coils and induction loads should be equipped with anti-interference protection systems, e.g. RC-type.
- Use of screened signal cables is recommended. Signal cable screens should be connected to the earthing only at one of the ends of the screened cable.
- In the case of magnetically induced interference the use of twisted couples of signal cables (so-called "spirals") is recommended. The spiral (best if shielded) must be used with RS-485 serial transmission connections.

The connections should be made accordingly to sticker on the top of converter's housing (Figure 4.1 - 4.2).

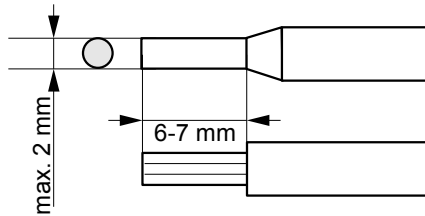


Figure 4.1. Method of cable insulation replacing and cable terminals

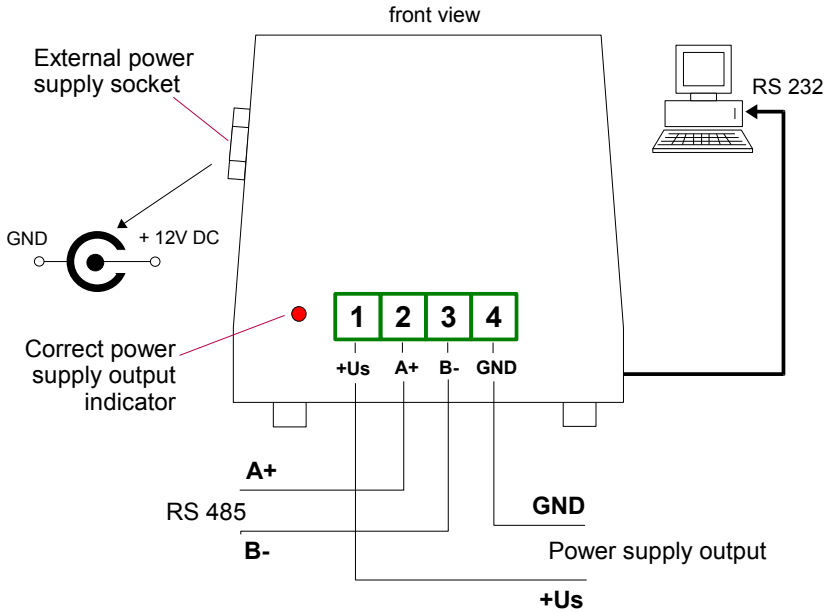


Figure 4.2 Connection method

The **SRS-2/4-Z16-B1a** module is not equipped with internal terminator. If the unit is installed on one end of RS 485 line external terminator (resistor 100 ÷ 150 Ohm delivered with the unit) must be installed (Figure 4.3). The RS 485 line should be equipped with terminators on both it's ends (Figure 4.4), RS 485 line can't be branched and longer than 1 km.

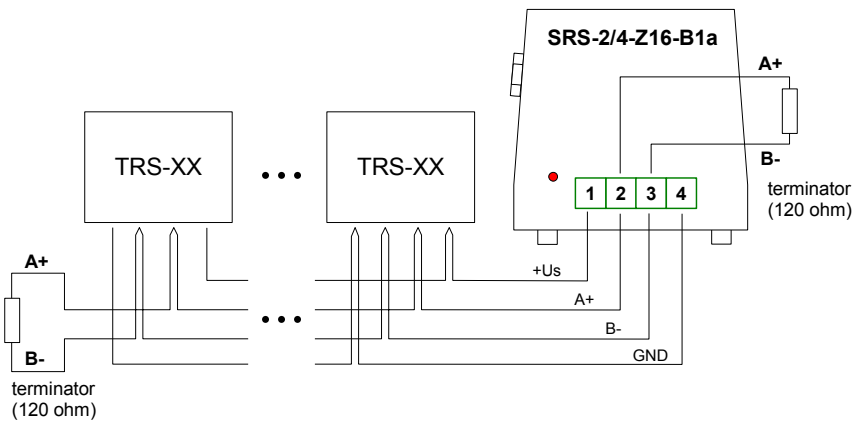


Figure 4.3 Proffered connection method

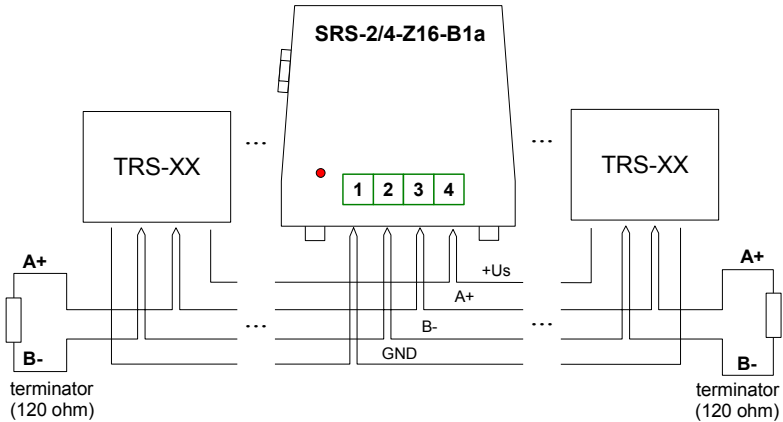


Figure 4.4 Accepted connection method

4.3. MAINTENANCE

The unit does not have any internal replaceable or adjustable components available to the user. Pay attention to the ambient temperature in the room where the unit is operating. Excessively high temperatures cause faster ageing of the internal components and shorten the fault-free time of unit operation.

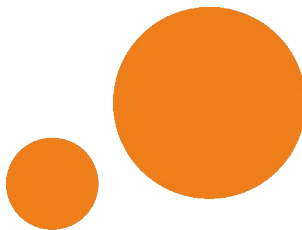
In cases where the unit gets dirty do not clean with solvents. For cleaning use warm water with small amount of detergent or in the case of more significant contamination ethyl or isopropyl alcohol.



Using any other agents can cause permanent damage to the housing.



Product marked with this symbol should not be placed in municipal waste. Please check local regulations for disposal and electronic products.



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