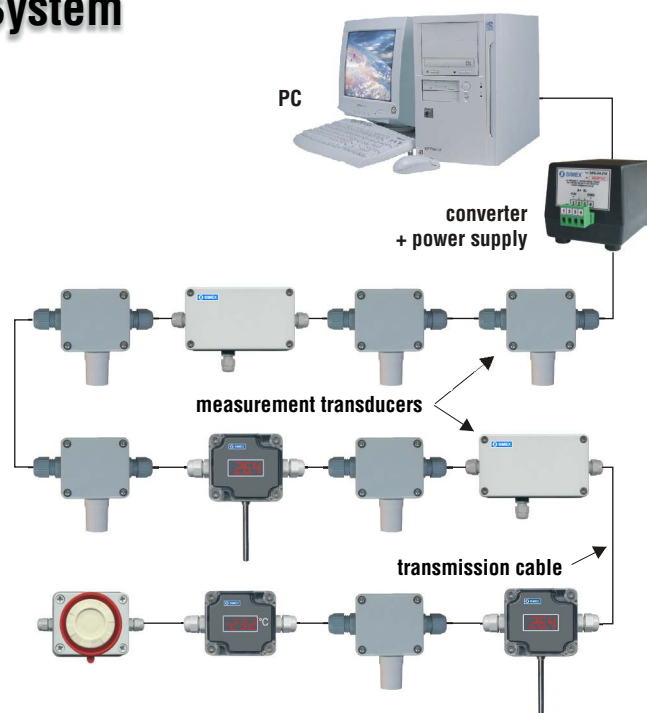


Temperature and Humidity Recording System TRS

- ✓ **Collecting, recording and storing data on temperature and humidity,**
- ✓ **Possibility of connecting between 1 and 127 measuring points,**
- ✓ **Measurement of temperature from 50°C to +550°C,**
- ✓ **Measurement of humidity from 0% to 100% RH,**
- ✓ **Two types of software: basic and advanced enabling presentation of results in tables or diagrams,**
- ✓ **Easy-to-assemble and operate.**



General Characteristics

The **TRS** Temperature and Humidity Recording System is a computer measurement system. Its basic tasks include: collecting, recording and displaying data on temperature and humidity eg. in cold stores, production halls, etc. Main elements of the system are: measuring and indicating devices, data transmission cable, protocol converter with a power supply and recording software. Optionally we also recommend using an surge protector to protect the computer and devices plugged into a common electrical power source. The TRS System has been designed in such a way that each customer could assemble it himself.

At present the **TRS** System includes: ambient temperature transducer (**TRS-01a**), temperature transducer to work with a Pt100 sensor (**TRS-02a**), temperature and humidity transducer (**TRS-04a**), ambient temperature transducer with display (**TRS-11**), wall mounted indicator (**TRS-10**), additional power supply (**TRS-09a**) and sound signal device (**TRS-B1**).

Data is exchanged and facility devices are supplied by means of a four-conductor screened **transmission cable** (maximum length: 1 km) connecting all system devices to the computer.

Up to 127 devices can be connected to the system and thanks to this we can reduce the number of "cable routes", which is a basic factor that increases costs.

Data between transducers operating to the RS485 industrial standard and the office computer equipped with the RS485 standard, are exchanged by means of the **protocol converter with power supply (SRS-2/4-Z16-B1a)**. We placed the measuring converter power supply in one casing to make assembly as easy as possible.

The System is mainly used in the food industry: in meat, fish and milk processing plants as well as in all other places where continuous measurement and recording of temperature and humidity are required. The standards impose an obligation to record temperature in rooms with controlled temperature and to store the data for more than 2 - 3 years (depending on the industry).

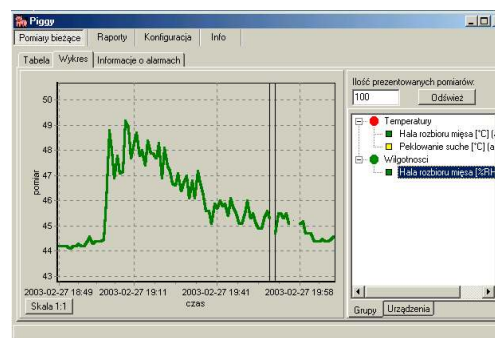
System - Computer Communication

The **Piggy** software is used for the computer communication system. The basic task of this application is to collect data from a network of scattered measuring devices, to store results in a database, present them in tables and diagrams as well as to create and print reports. Depending on the needs there are two versions of the **Piggy** software:

Basic Piggy application

- temperature and humidity recording from a long period of time,
- data displaying in the form of a diagram,
- report generation within a specified period of time.

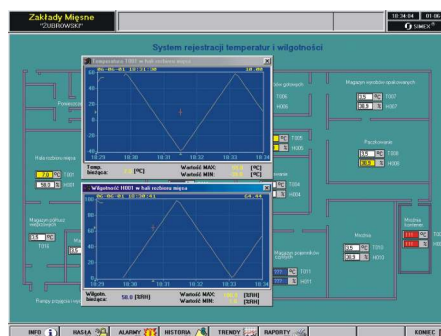
During operation, results of measurements are presented in the form of a diagram. On the right side of the diagram there are controls that enable definition of data presented in the diagram and determination of a starting and ending dates of presented data. The user may select from the list those devices whose measurements will be presented in the diagram.









TRS System - advanced Piggy application



For big production plants we recommend a version based on the Asix visual rendering software:

- data rendering in the graphic and tabular form
- data archiving on the computer hard disk
- a scheme of arrangement of production premises presented on one screen
- emergency and alarm signalling (damage to a sensor, measurement errors, etc.)



Type	TRS-01a	TRS-02a	TRS-04a
TRS Recording System	 Ambient Temperature Transducer	 Temperature Transducer	 Temperature and Humidity Transducer
General Characteristics	<p>The ambient temperature transducer is a basic device of the TRS System. It is designed particularly to measure temperature in rooms where food products are manufactured and stored. It is equipped with Modbus RTU communication bus. It has a small plastic casing. It measures temperature within the range of 40°C to +85°C</p>	<p>The temperature transducer is designed for multipoint measurement of temperature by means of a standard Pt100 sensor. In particular it is designed for use with bayonet sensors to be used, for example, in smoke-houses. It may be used with any Pt100 sensors. This module features very good compensation of effect of connection cable resistance on the result of temperature measurement. Non-linear characteristics of the sensor is digitally linearized. The module is equipped with Modbus RTU communication bus.</p>	<p>The temperature and humidity transducer is designed for multipoint temperature and humidity measurement systems. In particular it is used for measuring conditions in rooms where food products are manufactured and stored. The module is equipped with Modbus RTU communication bus.</p>
Technical Data			
Supply voltage	typically 10 VDC (9 VDC - 12 VDC)	typically 10 VDC (9 VDC - 12 VDC)	typically 10 VDC (9 VDC - 12 VDC)
Power consumption During operation During Modbus transmission	4,2 mA up to 60 mA	12 mA 65 mA	4,2 mA up to 60 mA
Temperature sensor Measurement range Measurement error	Semiconductor integrated circuit -40°C to +85°C within the range -10°C to +50°C: ±0,5°C	Pt 100 sensor -50°C up to +550°C ±0,2%	Semiconductor integrated circuit 0°C up to +70°C ±0,5°C
Humidity sensor Measurement range Accuracy Linearity Hysteresis Repeatability Stability	_____	_____	0% RH up to 100% RH ±2% RH (at 25°C, no condensation) ±0,5% RH (typically) ±1,2% RH ±0,5% RH ±1% RH (at 50% RH, within 5 years)
Number of modules in 1 network	maximum 127	maximum 127	maximum 127
Communication interface	RS 485 / Modbus RTU / 9600 bit/sec.	RS 485 / Modbus RTU / 9600 bit/sec.	RS 485 / Modbus RTU / 9600 bit/sec.
Working temperature Storing temperature	-40°C up to +85°C -40°C up to +85°C	-40°C up to +85°C -40°C up to +85°C	0°C up to +70°C -40°C up to +85°C
Fastening	to wall, 2 M3 bolts	to wall, 2 M3 bolts	to wall, 2 M3 bolts
Connection cable	4 conductors (2 supply conductors + 2 data transmission conductors)	4 conductors (2 supply conductors + 2 data transmission conductors)	4 conductors (2 supply conductors + 2 data transmission conductors)
Protection level	IP 65 (ABS casing) IP 30 (sensor)	IP 65	IP 65 (ABS casing) IP 30 (sensor)
Casing dimensions (LxWxD) Without chokes With chokes	63 x 58 x 35 mm 103 x 92 x 35 mm	80 x 82 x 55 mm 130 x 105 x 55 mm	63 x 58 x 35 mm 103 x 92 x 35 mm
Remarks		Acceptable connection cord resistance: up to 20 in each cord!	Do not exceed the temperature range of 0 - 70°C. The module should not be used where water vapour condensation occurs.

Type	TRS-11	TRS-10	TRS-B1
TRS Recording System	 <p>Ambient Temperature Transducer with Display</p>	 <p>Wall Mounted Indicator</p>	 <p>Sound Signal Device</p>
General Characteristics	<p>The TRS-11 ambient temperature transducer with a display is designed for multipoint temperature measurement within the range of 40°C up to +85°C. It is particularly designed to measure temperature in rooms where food products are manufactured and stored. A display located on the front panel enables the reading of current temperature and autonomous operation of the module (without a computer system). It is equipped with Modbus RTU communication bus.</p>	<p>The TRS-10 wall mounted indicator is designed to display digital values and short, 4-letter messages. This superior system makes the display flicker when a displayed value is not refreshed. It is a slave device that communicates with the Master device via RS 485 interface with Modbus RTU protocol. The indicator is dedicated to the TRS Temperature Recording System, yet it can cooperate with any superior system equipped with RS 485 link with Modbus RTU protocol.</p>	<p>The TRS-B1 sound signal device is designed to signal events with a sound or light. It is controlled by means of RS 485 link, which allows for activating of the sound signal (a buzzer with variable tone) and/or light signal (a flickering diode). The module is dedicated to the TRS Temperature Recording System and it is equipped with Modbus RTU communication bus. It can be used with other systems where the communication is consistent with the Modbus RTU standard.</p>
Technical Data			
Supply voltage	typically 10 VDC (9 VDC - 12 VDC)	typically 10 VDC (9 VDC - 12 VDC)	typically 10 VDC (9 VDC - 12 VDC)
Power consumption During operation During Modbus transmission	up to 30 mA up to 80 mA	up to 30 mA up to 80 mA	9.5 mA in standby 70 mA while signalling up to 60 mA when signalling switched off
Temperature sensor Measurement range Measurement error	Semiconductor integrated circuit -40°C to +85°C within the range -10°C to +50°C: ±0,5°C	_____	_____
Display	4 digits 9 mm high, increased brightness	4 digits 9 mm high, increased brightness	_____
Number of modules in 1 network	maximum 127		
Communication interface	RS 485 / Modbus RTU / 9600 bit/sek.		
Working temperature Storing temperature	-40°C up to +85°C -40°C up to +85°C		
Fastening	to wall, 2 M3 bolts		
Connection cable	4 conductors (2 supply conductors + 2 data transmission conductors)		
Protection level	IP 65 (ABS casing) IP 40 (sensor)	IP 65 (casing)	IP 65 (casing)
Casing dimensions (LxWxD) Without chokes With chokes	64 x 58 x 35 mm 103 x 78 x 35 mm	63 x 58 x 35 mm 103 x 58 x 35 mm	64 x 58 x 90 mm 103 x 65 x 90 mm
Remarks			

Type	TRS-09a	SRS-2/4-Z16-B1a
TRS Recording System		
General Characteristics	<p>TRS-09 is a supporting power supply for the TRS System which supplies stabilized direct voltage 11.5V. It can work in two modes: as a controlled supply (switched on with external voltage 7-12V) or a non-controlled supply. The configuration is selected by means of a link. Current efficiency is 200 mA. The supply is resistant to output voltage short circuit. The device is located in a casing that completely protects it against dust or low pressure streams of water.</p>	<p>The SRS-2/4-Z16-B1a recorder serves as:</p> <ul style="list-style-type: none">- power supply for the system of measurement sensors;- RS232/RS485 standard converter;- galvanic separator of RS232 and RS485 circuits;- data recorder. <p>It is a two-processor device equipped with a real time clock powered with a lithium battery and flash nonvolatile memory (1 MB) to record approx. 40 000 measurements. After re-activating Piggy software program all recorded measurements are copied to a PC, and the recorder buffer is emptied.</p> <p>Basic tasks of the device are:</p> <ul style="list-style-type: none">- connection of the TRS System modules network with a PC equipped with RS232 interface;- automatic recording of measurements when the Piggy program (or the computer) is switched off. <p>Recorder is delivered from a supporting external power supply with efficiency 0,8A / 12V DC.</p> <p>RS 232/RS 485 interface converter: adjusted to the requirements of Modbus RTU protocol (transmission speed 9600 bits/sec.). It ensures full galvanic insulation (optoisulation) between RS 232 interface and RS 485 lines and it can work with any SIMEX devices equipped with a RS 485 standard link. It can also be used for the transmission between devices equipped with RS 485 interface and a computer with RS 232 link.</p>
Technical Data		
Supply voltage	230 V AC +10/-5%	typical 12 V DC
Supply output voltage	11,5 V ±5%	10,5 V ±5%
Current efficiency	200 mA	0,5 A (maximum)
Galvanic separation	—————	Output of the supply and signals of RS485 link from RS232 link
RS 232 interface link	—————	1x 9 PIN Canon (RS 232); 1,3 m cord
Transmission protocol	—————	MODBUS RTU
Transmission parameters	—————	9600/8/1/N
Working temperature	0°C up to +50°C	0°C up to +50°C
Storing temperature	-10°C up to +70°C	-10°C up to +70°C
Casing dimensions (LxWxD)	80 x 82 x 55 mm; 130 x 105 x 55 mm with chokes	150 x 70 x 68 mm
Humidity	Up to 90% without condensation	Up to 90% without condensation
Weight	365 g	365 g
Recorder memory	—————	1 Mb (approx. 40 000 measurements)
Remarks	Control voltage: from 7 V to 12 V, max 2 mA	Built-in battery powered RTC clock