

# User manual

**WTR 630**



version 1.1.1

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## WTR 630

### 1. General

#### 1.1 Brief description

The WTR 630 is a compact temperature switch with programmable switching point and adjustable hysteresis. The temperature value recording functions according to the thermoresistive principle and is carried out via a temperature-dependent PT100 resistor. The WTR 630 has a digital RS485 interface with a Modbus RTU protocol, via which the sensor data can be transmitted and configurations can be made. This temperature switch can be used for two-point control with adjustable hysteresis.

#### 1.2 Overview presentation



#### 1.3 Drawings, shortcut



##### **Warning!**

A non-observance can cause injuries to persons and/or the demolition of the device. There can be a dangerous to life.



**Attention!**

A non-observance can cause a faulty operation of the device or lead to property damage.



**Information!**

A non-observance can have influence on the operation of the device or cause unintentional reactions of the device.



Gefahr

**Danger!**

When not observing the safety instructions, there is a risk of serious or fatal injuries caused by electrical power.



Warnung

**Warning!**

Possibly a dangerous situation can occur, which results in burns because of hot surfaces or liquids, if not avoided.

## 2. Transport, Packaging, Storage

### 2.1 Transport

Check the instrument for any damage that may have been caused during transportation. If, report them immediately. The temperature during transportation and storage of the meter must be within the range of -10 °C to 50 °C.

### 2.2 Packaging

Do not remove packaging until just before mounting. Keep the packaging as it will provide optimum protection during transport (e.g. change in installation site, sending back).

### 2.3 Storage

For longer term storage avoid the following influences:

1. Direct sunlight or proximity to hot objects
2. Mechanical vibration, mechanical shock (putting it hard down)
3. Soot, vapour, dust and corrosive gases

If possible store the device in its original package or an equivalent one

## 3. Safety instructions



More important safety instructions can be found in the individual chapters.

### 3.1 Intended use of the product

The sensor has been designed and built solely for the intended use described here and may only be used accordingly. The technical specifications contained in these operating instructions must be observed. Improper handling or operation of the instrument outside of its technical specifications requires the instrument to be taken out of service immediately and an inspection by the manufacturer. When the instrument is transported from a cold into a warm environment, the formation of condensation may result in the instrument malfunctioning. Before putting it back into operation, wait for the instrument temperature and the room temperature to equalise. The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

### 3.2 Stuff qualification



Warnung

Improper handling can result in considerable injury and damage to equipment. The activities described in these operating instructions may only be carried out by skilled stuff who have the qualifications described below. Keep unqualified stuff away from hazardous areas.

For installation and starting of the flow-meter the stuff has to be familiar with the relevant regulations and directives of the country and must have the qualification required. They must have knowledge on measurement and control technology, have to be acquainted with electric circuits, are capable of carrying out the work described and can independently recognize potential hazards. Depending on the operation conditions of the application they have to have the corresponding knowledge, e.g. of aggressive media.

### 3.3 Special hazards



Warnung

For hazardous media such as oxygen, acetylene, flammable or toxic gases or liquids, refrigeration plants, compressors, etc., in addition to all standard regulations, the appropriate existing codes or regulations must also be followed. **If you do not observe the appropriate regulation, serious injuries and/or damage can occur!**



Warnung

A protection from electrostatic discharge (ESD) is required. The proper use of grounded work surfaces and personal wrist straps is required when working with exposed circuitry (PCB, printed circuit boards), in order to prevent static discharge from damaging sensitive electronic components.



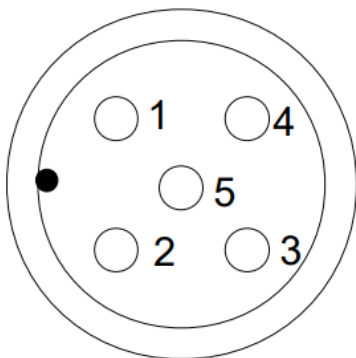
There is a danger of death caused by electric current. Upon contact with life parts, there is a direct danger of death. Electrical instruments may only be installed and connected by skilled electrical personnel. Operation using a defective power supply unit (e.g. short circuit from the mains voltage to the voltage output) can result in life-threatening voltages at the instrument.



Residual media in dismantled instruments can result in a risk to personnel, the environment and equipment. Take sufficient precautionary measures. Do not use this instrument in safety or Emergency Stop devices. Incorrect use of the instrument can result in injury. Should a failure occur, aggressive media with extremely high temperature and under high pressure or vacuum may be present at the instrument.

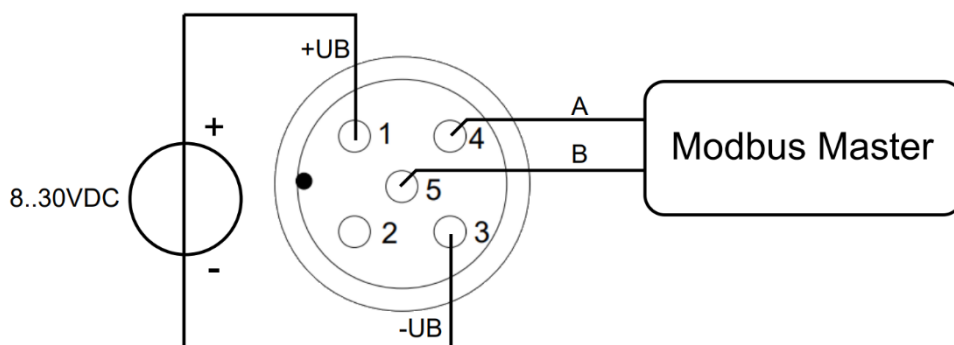
## 4. Starting operation

### 4.1 Connection M12 connector

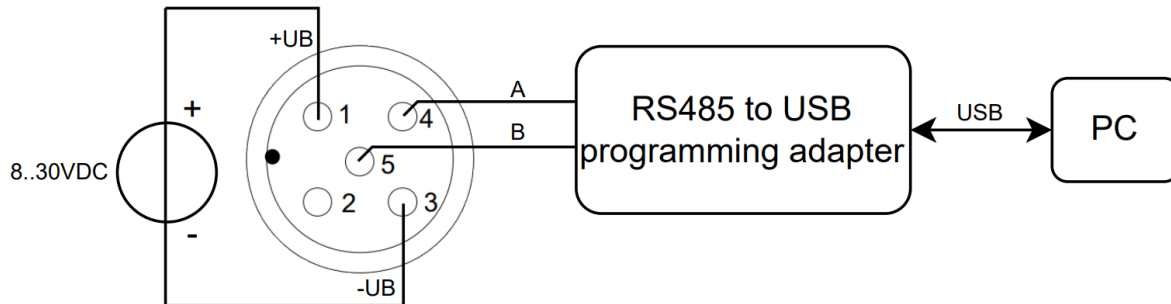


- 1: + Power supply
- 2: Output PNP
- 3: - Power supply
- 4: Interface RS485 (A)
- 5: Interface RS485 (B)

### 4.2 Connection configuration via Modbus Master



### 4.3 Connection configuration via Windows software



### 4.4 Mounting

Install the sensor in your process before electrical assembly. In this way you avoid winding up the cable when mounting the measuring point.

**M12 connector:** Turn the M12 socket by hand onto the connector on the promesstec sensor. Mounting is done without tools.

When installing the connection cable, ensure that both components are firmly and positively connected. The permissible tightening torque can be found the data sheet of the respective connection cable.

## 5. Putting into operation



Before switching on the device, it should be checked whether the sensor has been correctly installed and wired.

### 5.1 Configuration via Modbus Master

#### Modbus RTU parameters

Interface	RS485
Baudrate	115200
Databits	8
Parity	None
Stopbits	1

Modbus-ID                      Depending on the configuration of the WTR630 (1 - 247)



Default: 1

**To establish successful communication, the Modbus master must be set with the same parameters!**

### Modbus RTU register table

Holding Register					
Address		Datatype	Content	Description	Read/write permission
Hex	Dezimal				
0x0064	100	Float	Switching point 0	Switching point - first part of the floating point number according to IEEE754 standard	read/write
0x0065	101		Switching point 1	Switching point - second part of the floating point number according to IEEE754 standard	read/write
0x0066	102	Float	Hysteresis 0	Hysteresis - first part of the floating point number according to IEEE754 standard	read/write
0x0067	103		Hysteresis 1	Hysteresis - second part of the floating point number according to IEEE754 standard	read/write
0x0068	104	Int	Output logic	0: standard (temperature above switching point + hysteresis: output= high) 1: inverted (temperature above switching point + hysteresis: output= Low)	read/write
0x0069	105	Int	Modbus ID	Default: 1, Range: 1-247	read/write

Input Register					
Address		Datatype	Content	Description	Read/write permission
Hex	Dezimal				
0x0001	1	Char	Sensorbezeichnung	Sensorbezeichnung als ID WTR 630 = 0x1004	read
0x0002	2	Char	Production date	Day	read
0x0003-0x0004	3 - 4	Char	Production date	Month	read
0x0005	5	Char	Production date	Year	read
0x0006-0x0007	6 - 7	Char	Version number	Version number of the unit	read
0x0064	100	Int	Status	0: Sensor OK 1: Sensor broken	read
0x0065	101	Int	Temperatur INT	Measured temperature in 1:100	read
0x0066	102	Float	Temperature 0	Measured temperature - first part of floating point number according to IEEE754 standard	read
0x0067	103		Temperature 1	Measured temperature - second part of floating point number according to IEEE754 standard	read
0x0068	104	Int	Output status	0: Output=Low 1: Output=High	read

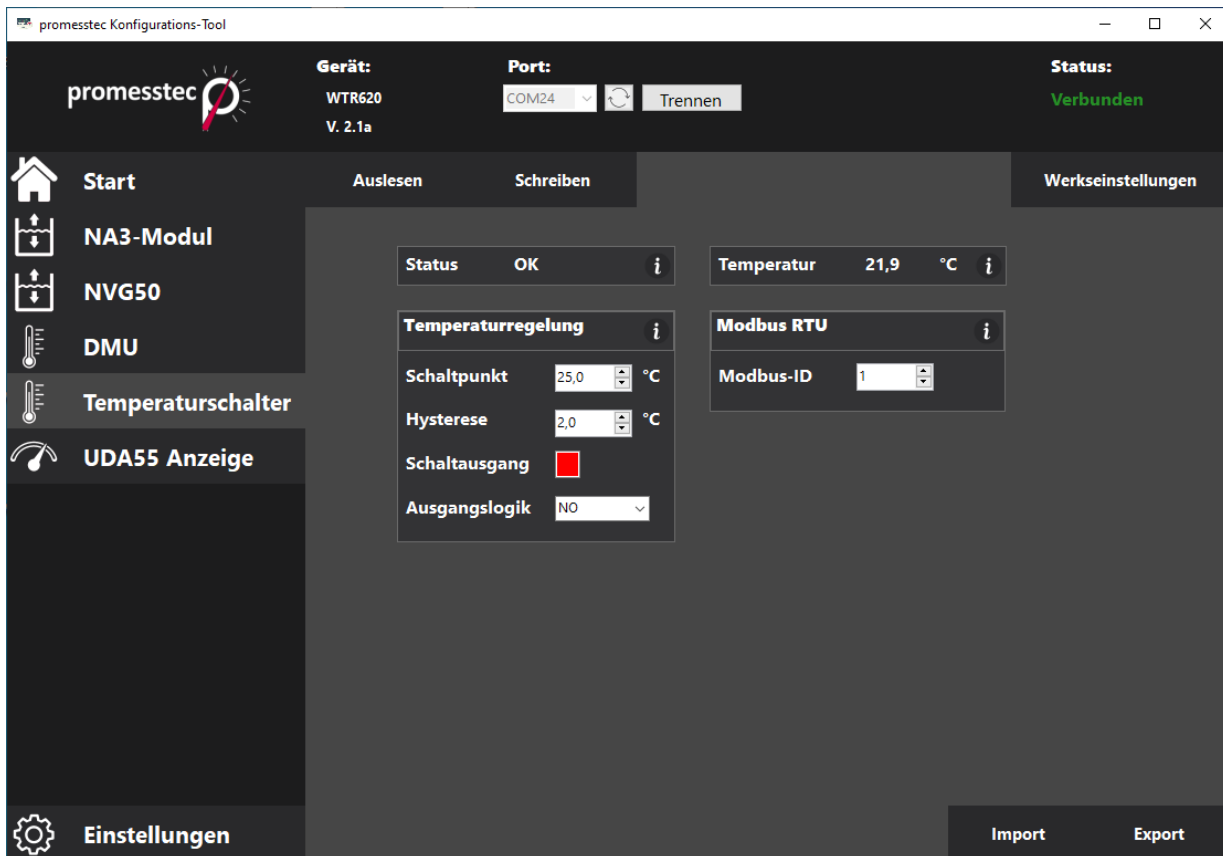
## 5.2 Configuration via Windows software

### 5.2.1 Windows Software „pmtKonfigTool“

The current settings of the WTR630 can be read out and changed via the Windows software "pmtKonfigTool". The installation file of the application can be downloaded from the website [www.promesstec.de](http://www.promesstec.de)

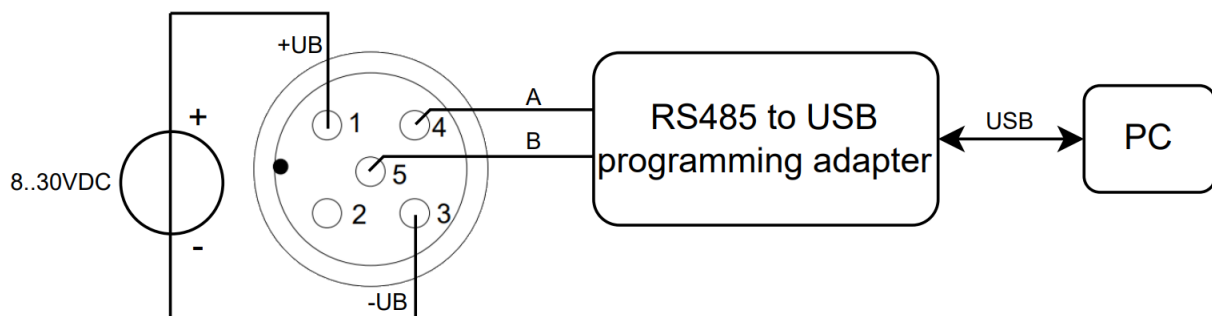
Configuration options include:


Switching point, hysteresis, output logic and the Modbus ID



## 5.2.2 PmtKonfigTool - Connection between WTR 630 and PC

To connect the WTR 630 to a PC, an RS485 to USB adapter is required. This can be ordered directly from promesstec (see data sheet). The wiring of the programming adapter is shown in the following figure:



To establish a connection between the PC and the WTR 630, the first thing to do is to select the correct COM port. All COM ports are listed in the drop-down list "Port". The button  updates the drop-down list. As soon as a connection has been successfully established, the status changes to "Connected" and the name of the connected device is displayed.

### 5.2.3 pmtKonfigTool – read

As soon as a connection with the display has been established, the settings are read out and displayed in the software. The status and the measured temperature are continuously updated. In addition, it is possible to press the "Read out" button to read out and display all settings again.

### 5.2.4 pmtKonfigTool – write

To change the settings of the WTR 630, the desired values must be entered in the Windows software and the corresponding options selected. However, the settings are only applied when the "Write" button has been pressed. If the writing process cannot be carried out successfully, the old settings of the WTR 630 are displayed again.

### 5.2.5 pmtKonfigTool - factory settings

By pressing the "Factory settings" button, all parameters and settings are reset to the factory settings.

Factory settings:

Switching point:	50°C
Hysteresis:	1°C
Modbus ID:	1

### 5.2.6 Status

In total, the WTR 630 can assume two different statuses, which provide information about the functionality of the temperature switch and the measurement.

Ok:	The WTR 630 works perfectly and no error has been detected.
Sensor break:	There is an internal error in the measured value recording.

### 5.2.7 Switching point

The switching point can be set here. Depending on the set output logic, the switching output changes its output status when the switching point is exceeded or undershot. (High, Low).

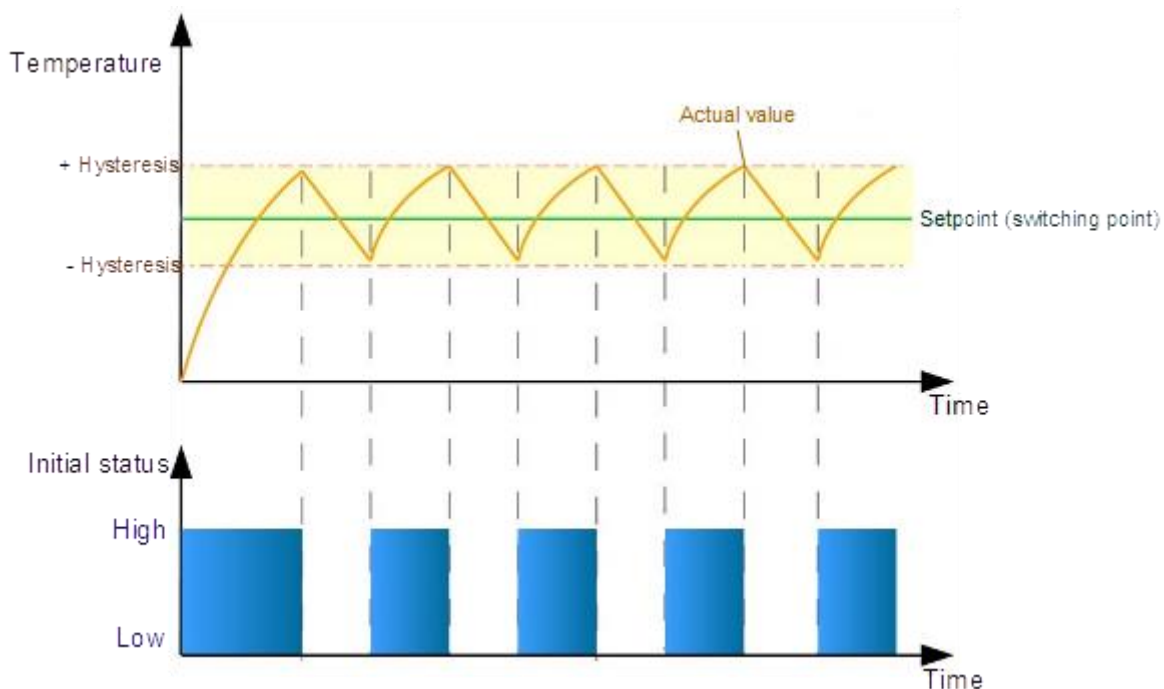
### 5.2.8 Hysteresis

The hysteresis represents the range by which the actual value may fluctuate around the setpoint. This is set to 1°C by default. In the case of particularly sluggish controlled systems, the temperature may fluctuate around the setpoint by more than the set hysteresis.

### 5.2.9 Output logic

The output logic of the WTR 630 can be inverted in the software. By default, this is set to NO (Normally open). If the setpoint is not reached, the output switches low. If the setpoint (+ hysteresis, if applicable) is exceeded, the High output switches. This output logic can be inverted.

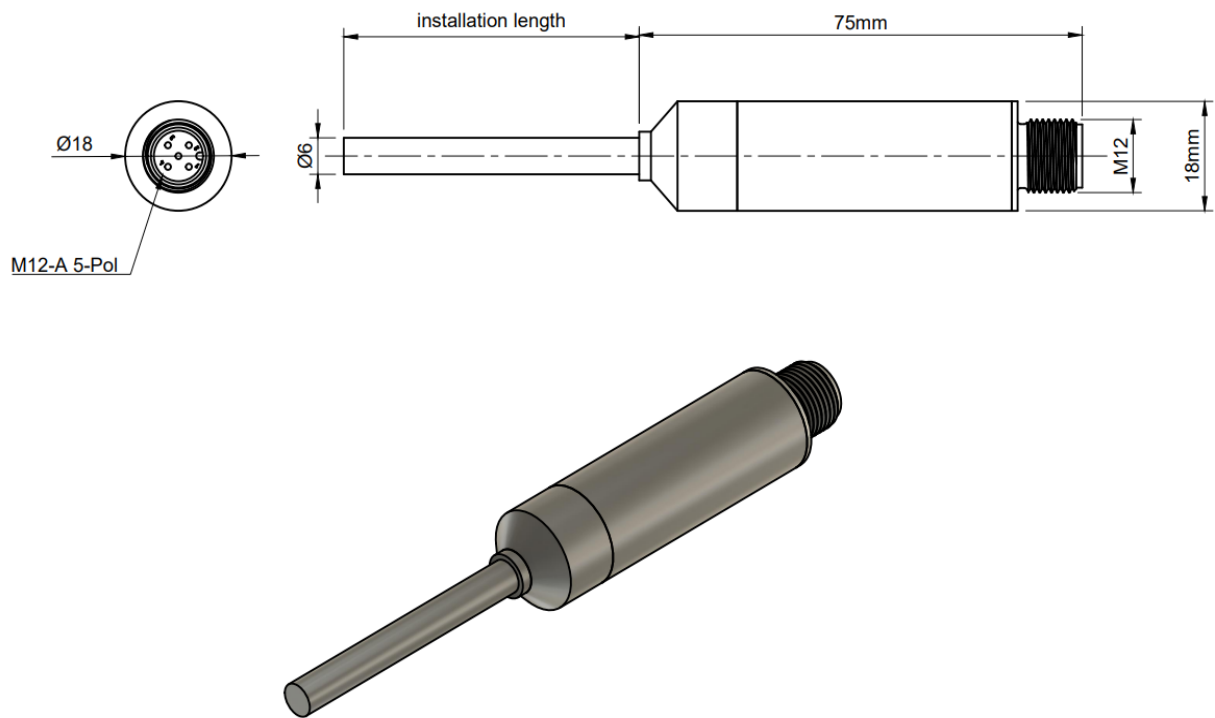
### 5.3 Switching behaviour WTR 630



## 6. Technical specifications

Operating voltage	UB = 8...30 V DC
Current requirement	15 mA + switching output PNP
Switch-on delay	<0.3s
Measured value recording	PT100 class A
Measuring range	-50°C to +150°C
Measurement deviation (accuracy)	< ±0.1% of final value
Output	Switching output PNP, (active max. 60 mA, short-circuit proof)
Control behaviour	two-point controller
Factory setting of switching point	50°C
Factory setting hysteresis	1°C
Factory setting Modbus ID	1
Protection class	IP69K according to DIN 60529
Electrical connection	M12 5-pole
Interface	RS485 Modbus protocol for configuration and reading out of measurement results and statuses
Process connection	compression fitting (see accessories)
Material Protection pipe	Stainless steel 1.4571 (V4A)
Diameter	6 mm
Storage temperature	-20 to 60 °C
Operating pressure	max. 10 bar
Humidity	0...95 % r. h.
Weight approx.	150 g

## 6.1 Technical drawing



## 7. Dismounting, Return, Cleaning, Disposal

### 7.1 Dismounting



Residual media in dismantled instruments can result in a risk of personnel, the environment and equipment. Take sufficient precautionary measures.



There is a risk of burns. Let the instrument cool down sufficiently before dismantling. During dismantling there is a risk of dangerously hot pressure media escaping.

Only disconnect the resistance thermometer once the system has been depressurised.

### 7.2 Return



When returning the instrument, use the original packaging or a suitable package.

To avoid a damage, use for example antistatic plastic film, shock-absorbent material, a marking as highly sensitive measuring instrument.

### 7.3 Cleaning



Before cleaning the instrument disconnect the electrical connection. Clean the instrument with a moist cloth. Electrical connections must not come into contact with moisture. Wash or clean the dismantled instrument before returning it in order to protect personnel and the environment from exposure to residual media.

Residual media in dismantled instruments can result in a risk to persons, the environment and equipment. Take sufficient precautionary measures.

### 7.4 Disposal



Dispose instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the sensor is supplied.