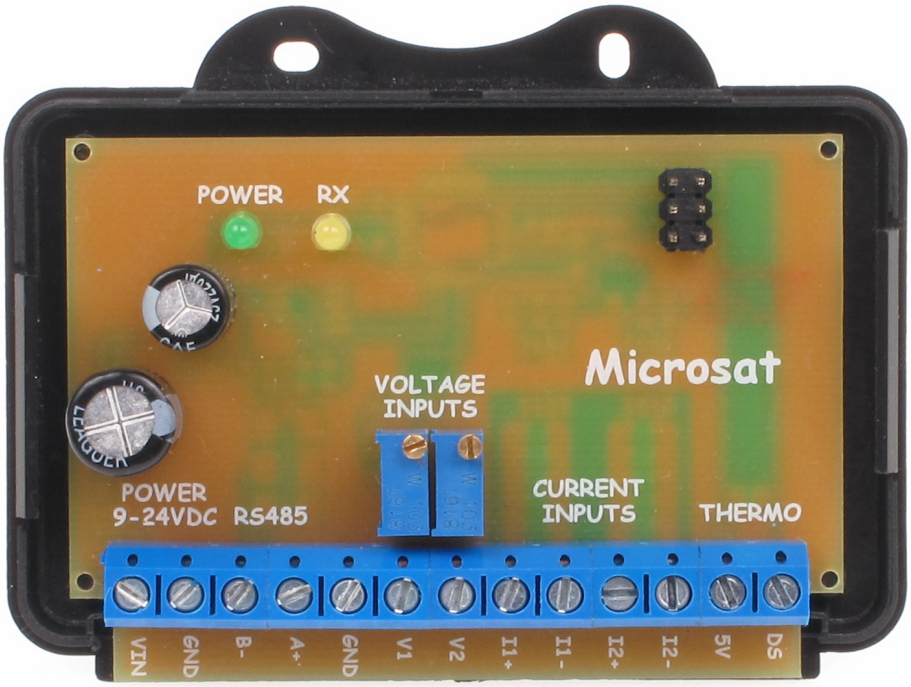
WXTelemetry

TELEMETRY MODULE FOR MICROSAT PRODUCTS
VOLTAGE AND CURRENT MEASUREMENT
TEMPERATURE INPUT FROM DS18B20/DS18S20

Instruction manual

(manual revision 07 June 2015)



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1. Technical parameters

Dimensions	60x85x30mm
Weight	65g
Supply voltage	12VDC typ. (9 - 28VDC)
Power consumption	15mA
Operating temperature	-30°C / +50°C
Data interface	RS-485 half-duplex
Communication range	1200m
Measurement frequency	1 Hz
Voltage measurement	
Voltage measurement range	Depending on potentiometer setting
Voltage measurement resolution	12-bit (10-bit + oversampling)
Current measurement	
Current measurement range	0 – 5A
Current measurement resolution	10-bit
Maximum safe continous measured current	3,5A
Maximum voltage on current measurement inputs (relative to ground)	24V
Maximum current measurement offset	50mA (constant within the measurement range)
Temperature measurement	
Supported thermometers	DS18B20 (12-bit), DS18S20 (9-bit)

2. Device description

WXTelemetry module allows the measurement of two voltages, two currents and temperature reading from DS18B20 or DS18S20 digital themometer. Measurements can then be read via the RS-485 bus. Module is designed to work with Microsat products but it may be possible to to read data from it by using any other device with a RS-485 bus (directly or via serial port adapter).

2.1. Connecting WXTelemetry to Microsat product

In order to connect WXTelemetry module, we use two differential RS-485 bus terminals. On the module side these terminals are labeled as RS-485 A+ and B-. For various Microsat products RS-485 bus pins are led out different way:

- For WX3in1 Plus 2.0 RS-485 pins are available via separate terminal on rear panel,
- For WX3in1 Plus and WX3in1 Mini RS-485 pins are available via MINIDIN connector on the rear panel (together with radio pins),
- For PLXDigi and PLXTracker RS-485 pins are available inside DB-9 connector.

Please check relevant device manuals for accurate pinout.

In RS-485 standard grounds of two devices doesn't need to be connected, which is desirable for long distance transmission. However, note that two devices can not have different potentials, otherwise communication will not work, and the potentials are discharged by the unit protection diodes. Therefore, two methods are used to connect:

- common ground (preferred and recommended for WXTelemetry),
- grounds fully separated (for example with power transformers).

So the simplest connection method is:

- connect WXTelemetry RS-485 A+ to RS-485 A+ port of relevant Microsat device,
- connect WXTelemetry RS-485 B- to RS-485 B- port of relevant Microsat device,
- connect WXTelemetry GND to the same ground as relevant Microsat device.

If you wish to connect more than one module on RS-485 bus (for example WXTelemetry + WXBits), then you should:

- connect WXTelemetry, WXBits and relevant Microsat device RS-485 A+ pins together,
- connect WXTelemetry, WXBits and relevant Microsat device RS-485 B- pins together,
- connect WXTelemetry, WXBits and relevant Microsat device GND to the same ground.

2.2. Voltage measurement

WXTelemetry module has two voltage measurement inputs. Input potentiometers are adjusted so that the full voltage range extends from 0 to 24V and matches the coefficients (coeff A, B, C) as proposed in the "Telemetry module" Tab in WX3in1 Plus 2.0 / WX3in1 Mini / WX3in1 Plus / PLXTracker / PLXDigi configuration software.

In case of any potentiometer adjustments, the measuring range changes and default coefficients will not match the actual measured voltage (coefficients will require modification based on calculations or test measurements).

The simplest solution is to leave the potentiometer in the default position, since

their re-adjustment may be difficult without connecting to a computer which allows reading the current measurements during adjustment.

Note that the voltage measurements are made relative to the measurement module ground potential.

2.3. Current measurement

WXTelemetry module has two current measurement inputs. The full measurement range extends from 0 to 5A. Always be careful not to exceed the permissible 24V voltage (relative to module ground potential) at the current measurement terminals. Measurement chips used in the device are not hall-effect sensors so potentials (voltages) at the terminals can not be arbitrary.

It is also important not to exceed the allowable continuous current (3.5 A) on the measurement resistors (between terminals I + and I-). The measurement is carried out based on the voltage drop across these resistors, which is associated with heat generation.

2.4. Temperature measurement

WXTelemetry module allows reading of temperature from DS18B20 or DS18S20 digital thermometer. In order to read measurements, please connect the thermometer as below:

- GND of thermometer to GND of the module,
- VDD supply to 5V output from module,
- data line DQ to DS terminal of the module.