

Background information:

20mA Interfaces

Basics

20mA transmission has its origins in the telex interfaces used by the post office. The technology was mainly applied to industrial terminal devices as well as computers in small and larger business systems. Devices of newer design no longer use the 20mA interface, generally favoring instead an RS485 bus interface.

Signals and Connectors

Unfortunately there is no standard regulating the 20mA interface, so that the market is characterized by a number of differently designed current loop interfaces. The connector form factor and configuration likewise differ among manufacturers, for example the signal names and the options for active and passive mode.

The universal W&T 20mA interfaces 84001 and 84201 do however offer a variety of operating modes to ensure successful establishment of a TTY connection.

Physical method of transmission

The 20mA or current loop interface transmits the serial data by switching a 20mA current on and off in a loop in synch with the data bits. In the rest state or during transmission of "1" bits, a constant current of 20 mA flows, whereas "0" bits are indicated by an interrupted current flow.

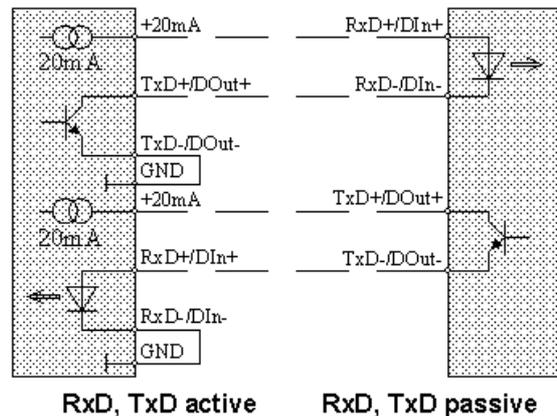
Within each current loop only one connected device is allowed to provide the required 20mA loop current. This device is referred to as active, and the other as passive. Decoupling of the user signals from the current loop is generally accomplished using optocouplers. This ensures in most applications that there is galvanic isolation between the connected devices, so that current loop interfaces generally allow data transmission over a distance of up to 1000 meters without any additional protection measures. The advantage of reliable transmission in the 20mA interface brings with it however a comparably low transmission rate of between 300 and 9600 baud.

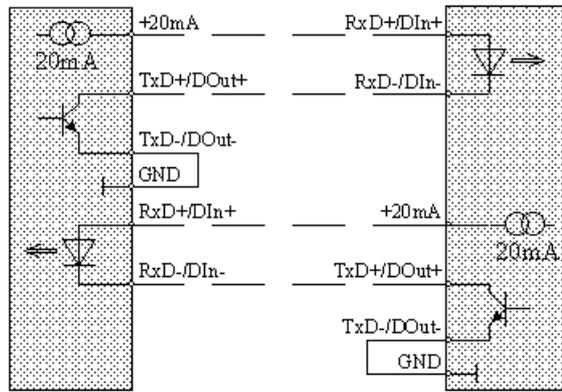
Special Features

Some 20mA devices permit bus operation in conjunction with the addressing functionality. Here all senders and receivers in the interfaces are wired in series. In a bus configuration you must note that the 20mA current source needs to be dimensioned for the corresponding number of devices.

Connection Examples

In practice, hooking up devices with 20mA interfaces often leads to problems due to the absence of a wiring standard and the potentially problematical active/passive configuration. If active switching is accomplished with a pre-resistor instead of a controlled current source, then the internal resistances and voltage drops at the senders and receivers must also be taken into account along with the total cable resistance. Details on this subject can be found in the manufacturer's documentation.





TxD active, RxD passive



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