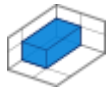


#01, M1S: Four-line RS232 port



Function: Simple RS232 port with only TX, RX, RTS, and CTS lines.

Form factor: [M1S](#)

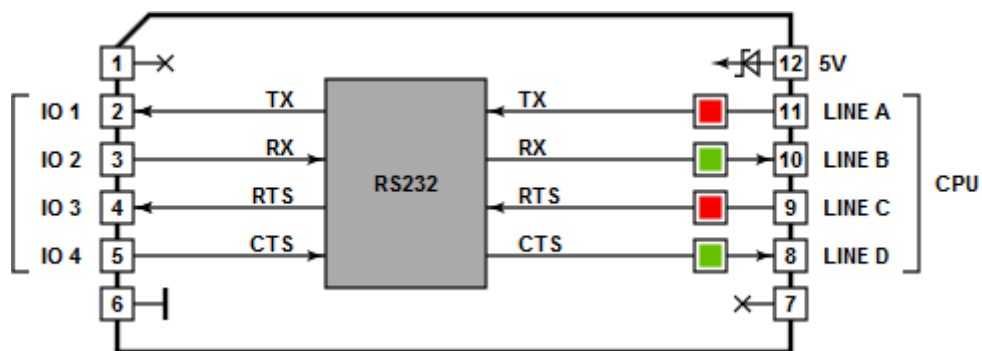
Category: Input/output module

Special needs: [\[SER\]](#), [\[INT\]](#)

Power requirements: 5V/[TBD](#)mA

Mates with: [#19](#), [#20](#), [#21](#) (limited use)

See also: [#02](#), [#05](#)



Details

This is a standard "simple" RS232 port. This Tibbit is based on a generic RS232 transceiver (we use Zynw ZT232F).

For "normal" RS232 applications, this Tibbit has to be connected to the TX and RX lines of the CPU's UART (see [\[SER\]](#)). Planning to use RTS/CTS flow control as well? An interrupt line must be available, too (see [\[INT\]](#)).

Combining this Tibbit with the "C" device [#19](#) (DB9M connector) will create a serial port with standard pin assignment on the DB9M:

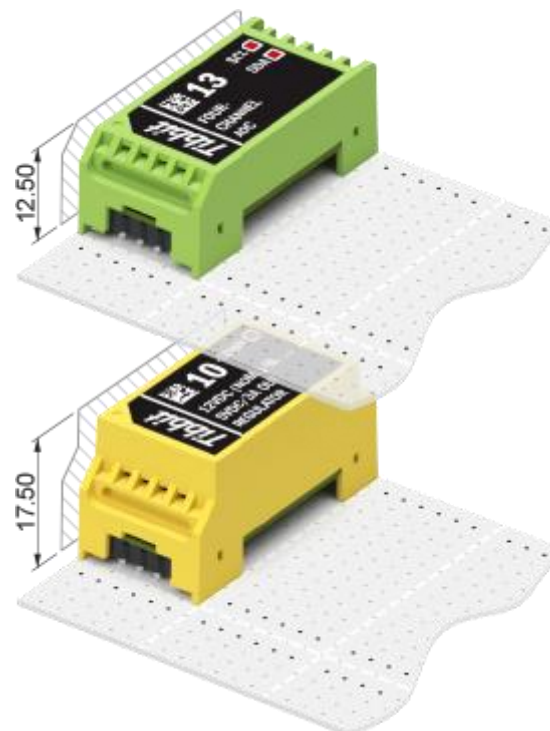
#1	<No connection>
#2	RX (input)
#3	TX (output)
#4	<No connection>
#5	Ground
#6	<No connection>
#7	RTS (output)
#8	CTS (input)
#9	<No connection>

You can also combine the RS232 Tibbit with [#20](#) (9 terminal blocks). Using [#21](#) (four terminal blocks) is also possible if you can steal the ground elsewhere (#21 doesn't have its own ground line).

LEDs

There are four LEDs: two red and two green. Red LEDs are connected to TX and RTS lines. Green ones are for RX and CTS. All LEDs are buffered (with logic gates) and light up for the LOW state of control lines.

Footprint and Color Coding








M1 Tibbits are single-width modules occupying one ["M" socket on the standard tile](#). Their footprint is roughly 7 x 14 "squares" (one "square" is 2.54 x 2.54 mm).

M1 devices have four I/O lines for interfacing with the outside world. We found four to be the magic number. it's just right for a wide variety of I/O functions.

M1s can be short (M1S) or tall (M1T). Most M1 devices fit into "short" 12.5mm shells, selected few are 17.5mm "tall".

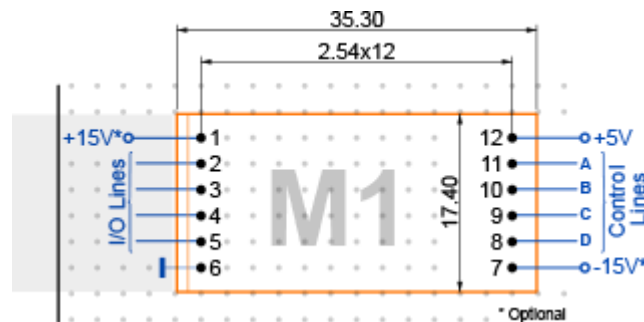
Each M1 module's color will tell you if it is an...

				
Input module	Output module	Input/Output	Power supply	Blank module

M1 Tibbits can incorporate up to [four status LEDs](#).

I/O pins

M1 modules have 2 rows of 6 pins:



Pins 8-11 are control lines A-D. They are for interfacing to our [embedded modules](#) or other microcontrollers. On [Tibbo Project PCBs](#) these pins are connected to the main processor.

Pins 2-5 are I/O lines facing the outside world. On Tibbo Project PCBs they go to Tibbit [connector sockets](#) (i.e. connect to [C1](#) and [C2](#) devices).

Pins 6 and 12 are the GROUND and +5V power pins. Most Tibbit Modules consume (take) 5V power. There are also power supply Tibbits that generate 5V power from a variety of sources. Those *output* 5V through pin 12. As an example of power Tibbits see Tibbits [#10](#) and [#23](#).

Pins 1 and 7 are for the additional +15V and -15V voltages. These are optional and only needed by few Tibbits. A special power supply Tibbit [#12](#) generates +/-15V from the main 5V power.