

# Small Computer Central

# SC702 – RCBus Backplane

SC702 is an RCBus modular backplane with 6 vertical bus sockets, 1 horizontal bus socket, and one horizontal bus plug.

**A 12-slot version of this backplane is also available: SC710 (<https://smallcomputercentral.com/sc710-rcbus-backplane/>)**



- SC702 – Assembly guide
  - SC702 – Compatibility
  - SC702 – Parts list
  - SC702 – Printed circuit board
  - SC702 – User guide

- SC700 series information (<https://smallcomputercentral.com/rcbus/sc700-series/>)
- SC700 series support (<https://smallcomputercentral.com/support/>)

## Downloads

- SC702, v1.0, Kit contents sheet (PDF) ([https://smallcomputercentral.com/wp-content/uploads/2024/01/sc702-kit-contents\\_v1.0.2\\_2024-01-13.pdf](https://smallcomputercentral.com/wp-content/uploads/2024/01/sc702-kit-contents_v1.0.2_2024-01-13.pdf))
- SC702, v1.0, Schematic (PDF) ([https://smallcomputercentral.com/wp-content/uploads/2023/04/sc702\\_v1.0.0\\_2023-03-21\\_00-14\\_schematic.pdf](https://smallcomputercentral.com/wp-content/uploads/2023/04/sc702_v1.0.0_2023-03-21_00-14_schematic.pdf))
- SC702, v1.0, PCB design files (OSHWLab) (<https://oshwlab.com/sccousins/sc702-v1-0-backplane-6-1-for-rcbus>)
- SC702, v1.0, Gerber files (ZIP) ([https://drive.google.com/file/d/1lC7prZ-vx8-ulZYEI05hR-YFU-A\\_hAfT/view?usp=share\\_link](https://drive.google.com/file/d/1lC7prZ-vx8-ulZYEI05hR-YFU-A_hAfT/view?usp=share_link))
- SC702, 3D printed mounting rails at [thingiverse.com](https://www.thingiverse.com/thing:6334939/files) (<https://www.thingiverse.com/thing:6334939/files>)

## Warnings

Assembly: Ensure the bus sockets are pressed firmly against the PCB alone their entire length

## Errata

Nothing known

## Suppliers

<b>Kits</b>	<b>Website</b>	<b>From</b>	<b>Currency</b>
Small Computers Direct	SCDirect ( <a href="https://small-computers-direct.square.site/s/search?q=sc702">https://small-computers-direct.square.site/s/search?q=sc702</a> )	UK	GBP
Stephen C Cousins	Tindie ( <a href="https://www.tindie.com/search/?q=sc702">https://www.tindie.com/search/?q=sc702</a> )	UK	USD
Small Computer Central	Lectronz ( <a href="https://lectronz.com/products/search?q=sc702">https://lectronz.com/products/search?q=sc702</a> )	UK	Euro/USD
<b>PCBs</b>	<b>Website</b>	<b>From</b>	<b>Currency</b>
Small Computers Direct	( <a href="https://small-computers-direct.square.site/s/search?q=sc733">https://small-computers-direct.square.site/s/search?q=sc733</a> ) SCDirect ( <a href="https://small-computers-direct.square.site/s/search?q=sc702">https://small-computers-direct.square.site/s/search?q=sc702</a> )	UK	GBP
Stephen C Cousins	Tindie ( <a href="https://www.tindie.com/products/tindiescx/picknmix-boards-for-rcbus-80pin/">https://www.tindie.com/products/tindiescx/picknmix-boards-for-rcbus-80pin/</a> )	UK	USD

Small Computer Central	Lectronz ( <a href="https://lectronz.com/products/pick-n-mix-boards-for-rcbus-80pin">https://lectronz.com/products/pick-n-mix-boards-for-rcbus-80pin</a> )	UK	Euro/USD
<b>Assembled and Tested</b>	<b>Website</b>	<b>From</b>	<b>Currency</b>
Not available			
<b>Components</b>			
See parts list			

*Small Computers Direct does not collect VAT for EU countries*

*Tindie does not collect VAT for EU countries*

*Lectronz does collect EU VAT for orders up to 150 EUR*

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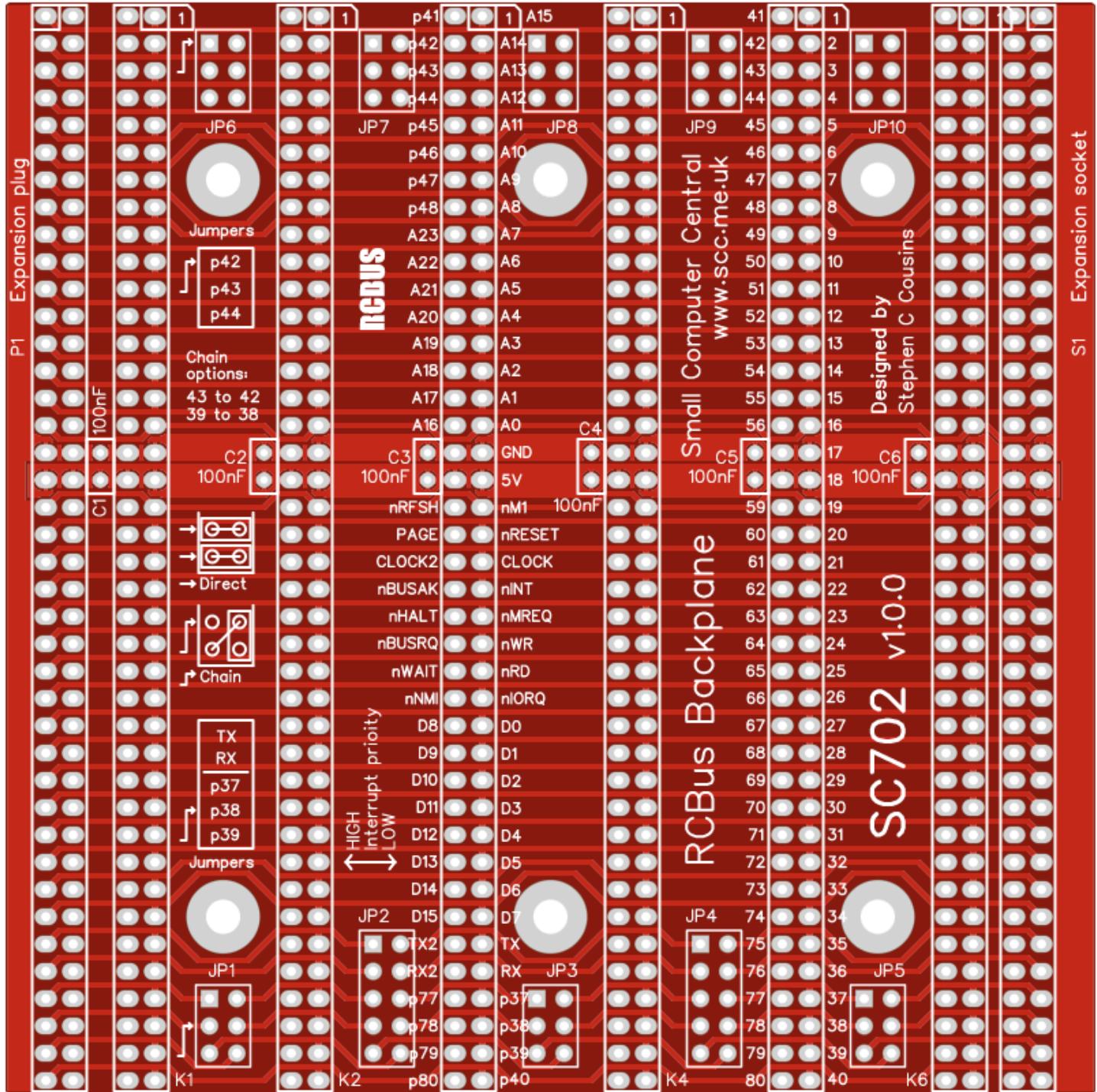
## Parts List

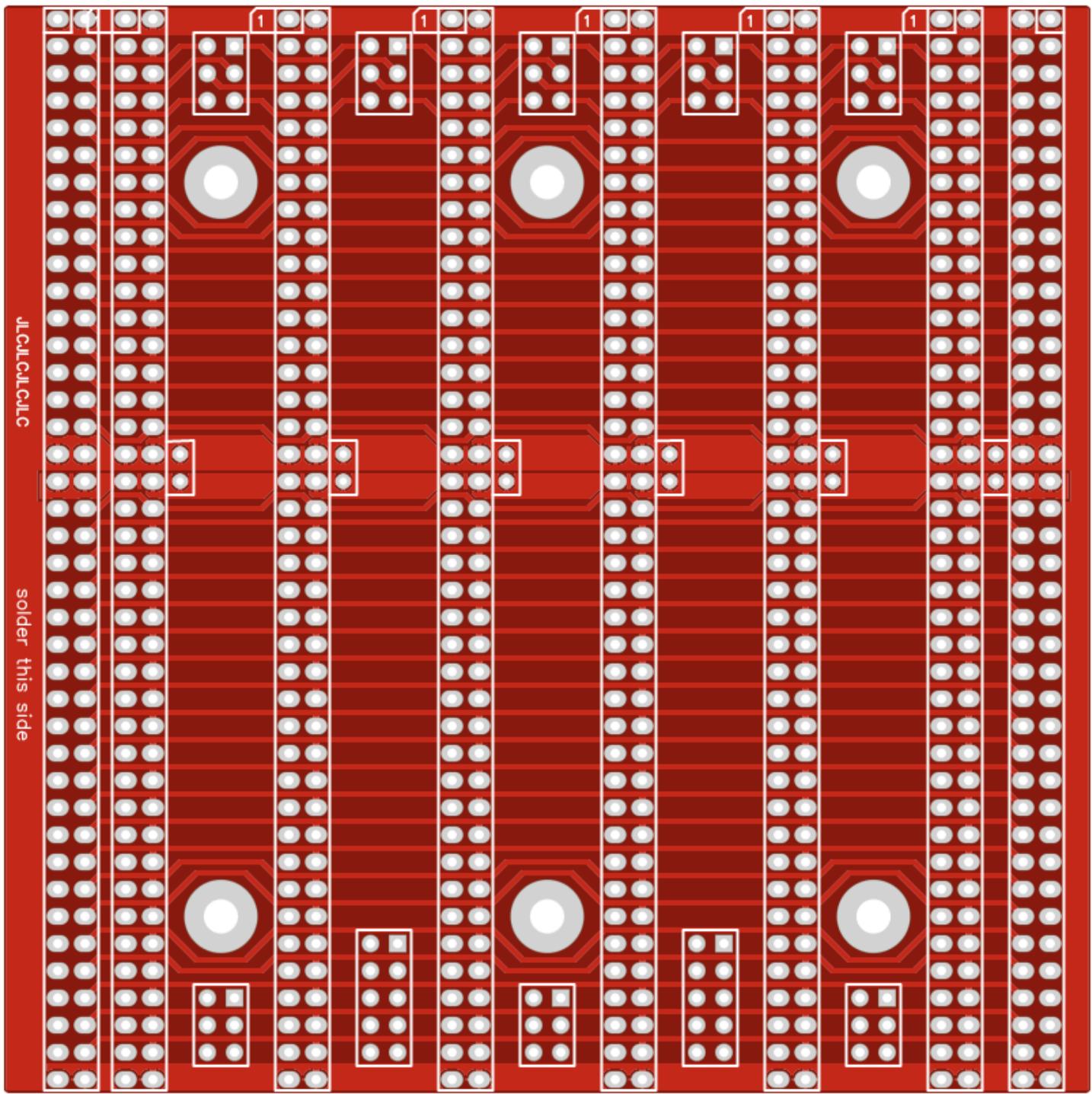
<b>Reference</b>	<b>Qty</b>	<b>Component</b>
PCB	1	SC702, v1.0, PCB
C1 to C6	6	Capacitor, ceramic, 100 nF
JP1, 3 and 5 JP6 to JP10	8	Header, male, 2 row x 3 pin, straight
JP2 and 4	2	Header, male, 2 row x 5 pin, straight
Jumper	34	Jumper shunt
K1 to K6	6	Header, female, 2 row x 40 pin, straight
P1	1	Header, male, 2 row x 40 pin, angled
S1	1	Header, female, 2 row x 40 pin, angled
Spacer	6	Spacer, 10mm, M3, nylon
Screw (for spacer)	12	Machine screw, 6mm, M3

*Component details and sourcing (<https://smallcomputercentral.com/components/>)*

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## Printed Circuit Board





## User Guide

This backplane section can be used as an extension to other backplane sections or it can be used as the only backplane in the system.

### Input/output port functions

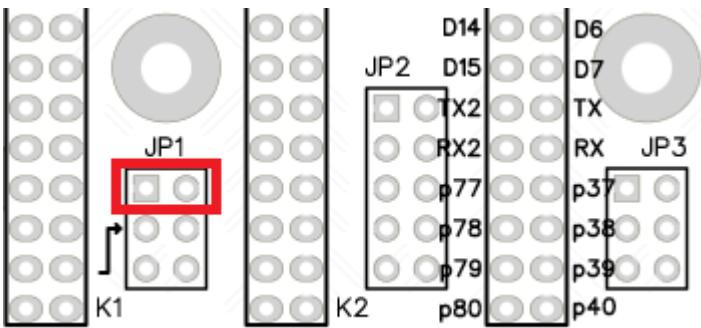
<b>I/O Address</b>	<b>Read</b>	<b>Write</b>
none	n/a	n/a

### Jumper options

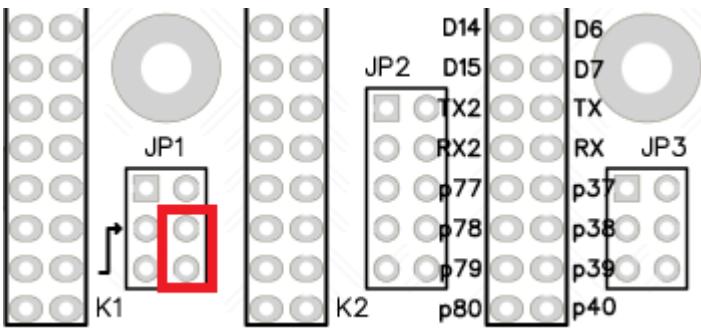
<b>Jumper</b>	<b>Function</b>

JP 1, 3, 5	JPx.1 Connect P37 signal between bus sockets JPx.2 Connect P38 signal between bus sockets* JPx.3 Connect P39 signal between bus sockets* * See daisy chain details below
JP 2, 4	JPx.1 Connect TX signal between bus sockets JPx.2 Connect RX signal between bus sockets JPx.3 Connect P37 signal between bus sockets JPx.4 Connect P38 signal between bus sockets* JPx.5 Connect P39 signal between bus sockets* * See daisy chain details below
JP6 to 10	JPx.1 Connect P42 signal between bus sockets* JPx.2 Connect P43 signal between bus sockets* JPx.3 Connect P44 signal between bus sockets * See daisy chain details below

JP 1 to JP10 allow some signals to be isolated between bus sockets. This can be helpful if there are several modules that use these signals for different functions.

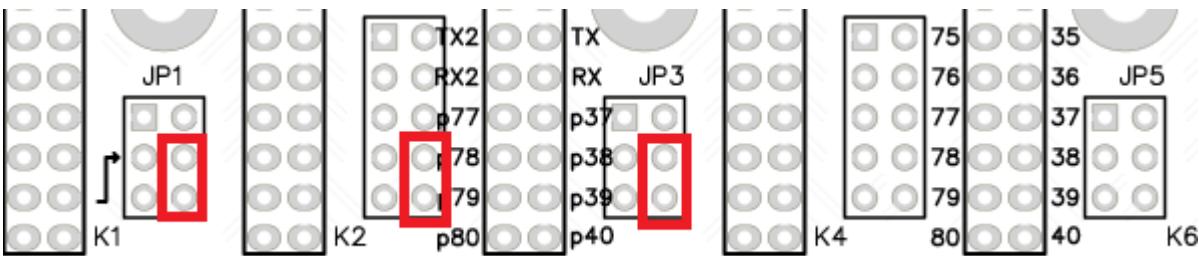


Typically the signals will be connected straight through to each bus socket by fitting jumper shunts horizontally, as illustrated to the left.



Alternatively, a daisy chain can be created from pin 39 to 38. This requires a jumper shunt to be fitted in the position illustrated to the left. A second daisy chain can be created from pin 43 to 42.

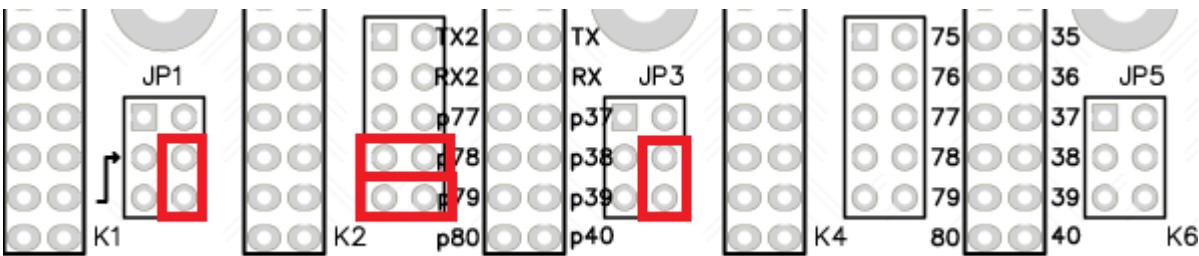
A daisy chain is created with two pins on each module. One pin is an output signal while the other is an input signal. The jumper connects the output of one module to the input of the next. The illustration below shows the jumper positions required to create a daisy chain between four modules, in bus sockets K1 to K4.



Daisy chains are typically used to create a priority ‘chain’. In the case illustrated above the output is from pin 39 of one module and this is connected to the input pin 38 on the input of module to the right. This creates a priority chain where the modules on the left are a higher priority than modules on the right.

Typical uses for a daisy chain are the Z80 mode 2 interrupt priority, IEI and IEO signals. This is specified as using pins 39 and 38. The second chain, using pins 43 and 42 can be used for a DMA priority chain.

Priority chains require all bus slots in the chain to be occupied by suitable modules. A gap can be left by fitting a pair of jumper shunts horizontally to pass the input and output signals straight through to the bus socket not use the chain signals, rather than being crossed from output to input pins.



The illustration above configures the backplane for a daisy chain where bus socket K3 does not receive a crossed chain signal and thus should not contain a module which is part of the chain. Socket K3 can be empty or can contain a module which does not have connections to pins 39 or 38.

## Assembly Guide

Below is the suggested order of assembly. A general guide to assembling circuit boards can be found here (<https://smallcomputercentral.com/assembly-guide/>).

- Decoupling capacitors C1 to C6  
These can be fitted either way around
- Header pins P1
- Bus socket S1
- Header pins JP1 to JP10
- Bus sockets K1 to K6  
Ensure the bus sockets are pressed firmly against the PCB along their entire length

## Compatibility

This backplane conforms fully to the RCBus specification v1.0 (<https://smallcomputercentral.com/rcbus/>) and thus supports: RCBus-2014, RCBus-Z80, RCBus-68xx, RCBus-9995.

The RCBus specification includes RCBus-2014 (both RC2014 standard 40-pin bus and RC2014 enhanced 60-pin bus) and also the full 80-pin RCBus. The 80-pin RCBus provides support for advanced Z80 features, such as the interrupt daisy-chain, as well as support for other processor families.

The following table indicates electrical compatibility with SC702. Check firmware and software details for any required software support.

<b>Product (80-pin)</b>	?	<b>Compatibility notes</b>
SC126 ( <a href="https://smallcomputercentral.com/sc126-z180-motherboard-rc2014/">https://smallcomputercentral.com/sc126-z180-motherboard-rc2014/</a> ) Z180 motherboard	✓	Adds Z180 SBC/ motherboard
SC701 ( <a href="https://smallcomputercentral.com/sc701-rcbus-backplane/">https://smallcomputercentral.com/sc701-rcbus-backplane/</a> ) Backplane 6+1	✓	Adds 6 module sockets RCBus 80-pin and PSU
SC702 ( <a href="https://smallcomputercentral.com/sc702-rcbus-backplane/">https://smallcomputercentral.com/sc702-rcbus-backplane/</a> ) Backplane 6+1	✓	Adds 6 module sockets RCBus 80-pin
SC703 ( <a href="https://smallcomputercentral.com/sc703-rcbus-power-supply-module/">https://smallcomputercentral.com/sc703-rcbus-power-supply-module/</a> ) Power from 12v	✓	Adds power supply (8 to 12 volt input) and reset
SC704 ( <a href="https://smallcomputercentral.com/sc704-rcbus-i2c-bus-master/">https://smallcomputercentral.com/sc704-rcbus-i2c-bus-master/</a> ) I2C bus master	✓	Adds I2C bus master and I2C EEPROM
SC705 ( <a href="https://smallcomputercentral.com/sc705-rcbus-serial-acia/">https://smallcomputercentral.com/sc705-rcbus-serial-acia/</a> ) Serial ACIA	✓	Adds one serial port Typically set to 0x40
SC706 ( <a href="https://smallcomputercentral.com/sc706-rcbus-z80-cpu-module/">https://smallcomputercentral.com/sc706-rcbus-z80-cpu-module/</a> ) Z80 CPU	✓	Adds Z80 CPU and main bus clock
SC707 ( <a href="https://smallcomputercentral.com/sc707-rcbus-memory-module/">https://smallcomputercentral.com/sc707-rcbus-memory-module/</a> ) Memory 128k	✓	Adds 128k RAM and 128k flash ROM
SC708 ( <a href="https://smallcomputercentral.com/sc708-rcbus-z80-sbc-module/">https://smallcomputercentral.com/sc708-rcbus-z80-sbc-module/</a> ) Z80 SBC	✓	Adds CPU, ROM, RAM clock and reset
SC709 ( <a href="https://smallcomputercentral.com/sc709-rcbus-backplane/">https://smallcomputercentral.com/sc709-rcbus-backplane/</a> ) Backplane 12+1	✓	Adds 12 module sockets RCBus 80-pin and PSU
SC710 ( <a href="https://smallcomputercentral.com/sc710-rcbus-backplane/">https://smallcomputercentral.com/sc710-rcbus-backplane/</a> ) Backplane 12+1	✓	Adds 12 module sockets RCBus 80-pin
SC711 ( <a href="https://smallcomputercentral.com/sc711-rcbus-prototyping-module/">https://smallcomputercentral.com/sc711-rcbus-prototyping-module/</a> ) Prototyping	✓	Prototyping module
SC712 ( <a href="https://smallcomputercentral.com/sc712-rcbus-power-supply-module/">https://smallcomputercentral.com/sc712-rcbus-power-supply-module/</a> ) Power from 5v	✓	Adds power supply (5 volt input) and reset
SC713 ( <a href="https://smallcomputercentral.com/sc713-rcbus-tool/">https://smallcomputercentral.com/sc713-rcbus-tool/</a> ) RCBus tool	n/a	Simple reference tool No electrical function

SC714 ( <a href="https://smallcomputercentral.com/sc714-rcbus-z80-memory-module/">https://smallcomputercentral.com/sc714-rcbus-z80-memory-module/</a> ) Memory 512k	✓	Adds 512k RAM and 512k flash ROM
SC715 ( <a href="https://smallcomputercentral.com/sc715-rcbus-compact-flash-module/">https://smallcomputercentral.com/sc715-rcbus-compact-flash-module/</a> ) Compact flash	✓	Adds Compact Flash storage
SC716 ( <a href="https://smallcomputercentral.com/sc716-rcbus-z80-sio-2-serial-module/">https://smallcomputercentral.com/sc716-rcbus-z80-sio-2-serial-module/</a> ) Z80 SIO/2	✓	Adds two serial ports Typically set to 0x84
SC717 ( <a href="https://smallcomputercentral.com/sc717-rcbus-z80-pio-module/">https://smallcomputercentral.com/sc717-rcbus-z80-pio-module/</a> ) Z80 PIO	✓	Adds parallel I/O using Z80 PIO
SC718 ( <a href="https://smallcomputercentral.com/sc718-rcbus-z80-ctc-module/">https://smallcomputercentral.com/sc718-rcbus-z80-ctc-module/</a> ) Z80 CTC	✓	Adds counter/timer using Z80 CTC
SC719 ( <a href="https://smallcomputercentral.com/sc719-rcbus-digital-i-o-module/">https://smallcomputercentral.com/sc719-rcbus-digital-i-o-module/</a> ) Digital I/O	✓	Adds digital I/O Eight in, eight out
SC720 ( <a href="https://smallcomputercentral.com/sc781-rcbus-z80-sbc-motherboard/">https://smallcomputercentral.com/sc781-rcbus-z80-sbc-motherboard/</a> ) Z80 motherboard	✓	Adds Z80 SBC/motherboard
SC721 ( <a href="https://smallcomputercentral.com/sc721-rcbus-memory-module/">https://smallcomputercentral.com/sc721-rcbus-memory-module/</a> ) Memory 512k	✓	Adds 512k RAM and 2 x 512k flash ROM
SC722 ( <a href="https://smallcomputercentral.com/sc722-rcbus-z180-cpu-module/">https://smallcomputercentral.com/sc722-rcbus-z180-cpu-module/</a> ) Z180 CPU	✓	Adds Z180 CPU with two serial ports
SC723 ( <a href="https://smallcomputercentral.com/sc723-rcbus-backplane-3/">https://smallcomputercentral.com/sc723-rcbus-backplane-3/</a> ) Backplane 3	✗	No male header pins for expansion
SC724 ( <a href="https://smallcomputercentral.com/sc724-rcbus-breakout-module/">https://smallcomputercentral.com/sc724-rcbus-breakout-module/</a> ) Breakout	✓	Prototyping breakout module
SC725 ( <a href="https://smallcomputercentral.com/sc725-rcbus-serial-and-timer-module/">https://smallcomputercentral.com/sc725-rcbus-serial-and-timer-module/</a> ) SIO+CTC	✓	Adds two serial ports and 4 counter/timers
SC726 ( <a href="https://smallcomputercentral.com/sc726-rcbus-clock-module/">https://smallcomputercentral.com/sc726-rcbus-clock-module/</a> ) Clock generator	✓	Generates CLK and CLK2 bus signals
SC727 ( <a href="https://smallcomputercentral.com/sc727-rcbus-rtc-module/">https://smallcomputercentral.com/sc727-rcbus-rtc-module/</a> ) Real time clock	✓	Adds real time clock for time and date
SC728 ( <a href="https://smallcomputercentral.com/sc727-rcbus-module-riser/">https://smallcomputercentral.com/sc727-rcbus-module-riser/</a> ) Module riser	✓	Simple module riser for RCBus 80-pin
SC791 ( <a href="https://smallcomputercentral.com/sc791-rcbus-z80-romwbw-computer/">https://smallcomputercentral.com/sc791-rcbus-z80-romwbw-computer/</a> ) Z80 system	✓	Modular Z80 system
SC792 ( <a href="https://smallcomputercentral.com/sc792-modular-z180-computer/">https://smallcomputercentral.com/sc792-modular-z180-computer/</a> ) Z180 system	✓	Modular Z180 system
<b>Product (40 pin)</b>	?	<b>Compatibility notes</b>

SC114 ( <a href="https://smallcomputercentral.com/2019/02/27/sc114-motherboard-kit/">https://smallcomputercentral.com/2019/02/27/sc114-motherboard-kit/</a> ) Z80 motherboard	✓	Z80 SBC/motherboard
SC130 ( <a href="https://smallcomputercentral.com/sc130-z180-motherboard/">https://smallcomputercentral.com/sc130-z180-motherboard/</a> ) Z180 motherboard	✓	Z180 SBC/motherboard
SC133 ( <a href="https://smallcomputercentral.com/sc133-modular-backplane-rc2014/">https://smallcomputercentral.com/sc133-modular-backplane-rc2014/</a> ) Backplane 11+1	✓	Adds 11 module sockets RCBus 40-pin and PSU
SC134 ( <a href="https://smallcomputercentral.com/sc134-led-output-module-rc2014/">https://smallcomputercentral.com/sc134-led-output-module-rc2014/</a> ) LED output port	✓	Adds eight LED outputs
SC135 ( <a href="https://smallcomputercentral.com/sc135-digital-output-module-rc2014/">https://smallcomputercentral.com/sc135-digital-output-module-rc2014/</a> ) Digital output port	✓	Adds eight digital outputs
SC136 ( <a href="https://smallcomputercentral.com/sc136-digital-input-module-rc2014/">https://smallcomputercentral.com/sc136-digital-input-module-rc2014/</a> ) Digital input port	✓	Adds eight digital inputs
SC137 ( <a href="https://smallcomputercentral.com/sc137-i2c-master-module-rc2014/">https://smallcomputercentral.com/sc137-i2c-master-module-rc2014/</a> ) I2C bus master	✓	Adds I2C bus master
SC139 ( <a href="https://smallcomputercentral.com/sc139-serial-68b50-module-rc2014/">https://smallcomputercentral.com/sc139-serial-68b50-module-rc2014/</a> ) Serial ACIA	✓	Adds one serial port Typically set to 0x40
SC141 ( <a href="https://smallcomputercentral.com/sc141-modular-backplane-rc2014/">https://smallcomputercentral.com/sc141-modular-backplane-rc2014/</a> ) Backplane 12+1	✓	Adds 12 module sockets RCBus 40-pin
SC142 ( <a href="https://smallcomputercentral.com/sc142-power-module-rc2014/">https://smallcomputercentral.com/sc142-power-module-rc2014/</a> ) Power from 12v	✓	Adds power supply (8 to 12 volt input) and reset
SC143 ( <a href="https://smallcomputercentral.com/sc143-rom-module-rc2014/">https://smallcomputercentral.com/sc143-rom-module-rc2014/</a> ) Flash ROM	✓	Adds 128k flash ROM
SC145 ( <a href="https://smallcomputercentral.com/sc145-compact-flash-rc2014/">https://smallcomputercentral.com/sc145-compact-flash-rc2014/</a> ) Compact flash	✓	Adds Compact Flash storage
SC147 ( <a href="https://smallcomputercentral.com/sc147-modular-backplane-rc2014/">https://smallcomputercentral.com/sc147-modular-backplane-rc2014/</a> ) Backplane 6+1	✓	Adds 6 module sockets RCBus 40-pin
SC148 ( <a href="https://smallcomputercentral.com/sc148-power-module-rc2014/">https://smallcomputercentral.com/sc148-power-module-rc2014/</a> ) Power from 5v	✓	Adds power supply (5 volt input) and reset
SC149 ( <a href="https://smallcomputercentral.com/sc149-z80-cpu-module-rc2014/">https://smallcomputercentral.com/sc149-z80-cpu-module-rc2014/</a> ) Z80 CPU	✓	Adds Z80 CPU and main bus clock
SC150 ( <a href="https://smallcomputercentral.com/sc150-paged-ram-module-rc2014/">https://smallcomputercentral.com/sc150-paged-ram-module-rc2014/</a> ) Paged RAM 128k	✓	Adds 128k of paged RAM

SC151 ( <a href="https://smallcomputercentral.com/sc151-paged-rom-module-rc2014/">https://smallcomputercentral.com/sc151-paged-rom-module-rc2014/</a> ) Paged ROM 128k	✓	Adds 128k of paged ROM
<b>Other suppliers</b>	?	<b>Compatibility notes</b>
RC2014 Mini system	✗	No male header pins for expansion
RC2014 Pro system	✗	No male header pins for expansion
RC2014 Zed system	✗	No male header pins for expansion
RC2014 Micro module	✓	Adds CPU, ROM, RAM serial, clock and reset
RC2014 Backplane 5	✓	If header pins fitted it adds 4 x 40-pin sockets
RC2014 Backplane 8	✗	No male header pins for expansion
RC2014 Backplane Pro	✗	No male header pins for expansion
RC2014 Z80 CPU	✓	Adds Z80 CPU
RC2014 SIO/2 dual serial	✓	Adds two serial ports at 0x80 to 0x87
RC2014 Compact flash	✓	Adds Compact Flash at 0x10 to 0x17
RC2014 Dual clock	✓	Generates CLK and CLK2 bus signals
RC2014 Pageable ROM	✓	Adds 64k paged ROM
RC2014 64k RAM	✓	Adds 64k paged RAM
RC2014 Memory 512k	✓	Adds 512k RAM and 512k flash ROM
RC2014 Digital I/O	✓	Adds eight LED outputs and eight push buttons
RC2014 Real time clock	✓	Adds real time clock for time and date
RC2014 RP2040 VGA terminal	✓	Connect VGA monitor and USB keyboard
RC2014 Pi Pico terminal	✓	Connect VGA monitor and USB keyboard

RC2014 YM2149 sound card	✓	Adds authentic retro sound
Weird electronics Flock v2	✓	Adds floppy disk and real time clock

## Notes

- This product is designed for hobby use and is not suitable for industrial, commercial, or safety-critical applications.
- The product contains small parts and is not suitable for young children.