SC532A
9-PIN PERIPHERAL TO RS232 INTERFACE
INSTRUCTION MANUAL

REVISION: 7/02

Warranty and Assistance

The **SC532A 9-PIN PERIPHERAL TO RS232 INTERFACE** is warranted by CAMPBELL SCIENTIFIC, INC. to be free from defects in materials and workmanship under normal use and service for twelve (12) months from date of shipment unless specified otherwise. Batteries have no warranty. CAMPBELL SCIENTIFIC, INC.'s obligation under this warranty is limited to repairing or replacing (at CAMPBELL SCIENTIFIC, INC.'s option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CAMPBELL SCIENTIFIC, INC. CAMPBELL SCIENTIFIC, INC. will return such products by surface carrier prepaid. This warranty shall not apply to any CAMPBELL SCIENTIFIC, INC. products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CAMPBELL SCIENTIFIC, INC. is not liable for special, indirect, incidental, or consequential damages.

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SC532A 9-Pin Peripheral to 9-Pin RS232 Interface

1. Function

The SC532A Peripheral Interface connects an IBM® PC compatible computer, with appropriate software, to certain Campbell Scientific datalogger peripherals including the COM200 modem, SM4M/16M and SM192/716 storage modules, MD9 multi-drop interface, and Seimac SCD/Argos satellite transmitter.

Like the SC532, the SC532A supplies 5 VDC on the PERIPHERAL connector (pin 1) to power 5V peripherals like the SM16M. The SC532A also supplies 12 VDC (on pin 8) to power 12V peripherals such as the COM200, high-speed modems, and certain radios.

The SC532A has an internal jumper that selects either "SC532" or "PROG" mode. PROGRAM mode is for configuring the Seimac SCD/Argos satellite transmitter. The factory setting is "SC532" which is appropriate for most applications. The case can be opened by twisting a 1/8 inch (3 mm) standard screwdriver in the four seam slots.

2. Physical Description

The SC532A 9-pin female D-Sub labeled "PERIPHERAL" connects to your CSI peripheral. Cable a PC COM port to the other 9-pin connector labeled "PC." The SC532A comes with an AC adapter supplying 12VDC @ 1A which is sufficient for any listed peripheral. The power jack on the SC532A allows convenient AC adapter replacement. If only 5V peripherals are used, an AC adapter outputting just 6 VDC with enough current capability and having the correct barrel connector size and polarity will do (see Tables 1 and 2).

An optional SC532A field cable is available (see Portable Battery Power section) which allows convenient operation of the SC532A from 12V datalogger power at remote sites lacking 120 VAC.

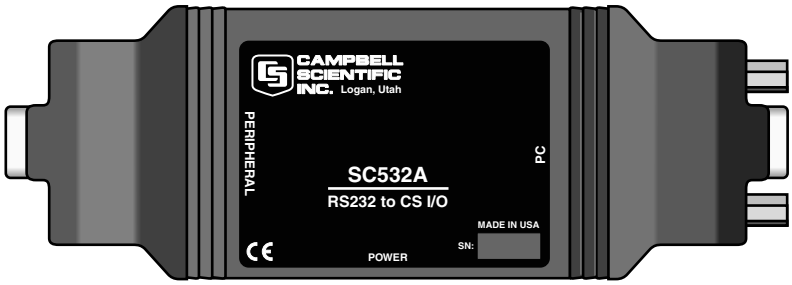


FIGURE 1. SC532A Case Top

3. Specifications

Input voltage (to POWER jack)	A) 5 Volt Peripherals require 6 – 17 VDC B) 12 Volt Peripherals require 12 – 17 VDC Barrel connector: inner bore (+), outer sleeve (–) (factory 120 V AC adapter supplies 12 VDC unregulated @ 1A)
Output voltages	+5 VDC ± 0.075 VDC on PERIPHERAL connector pin 1 and 6 – 17 VDC on PERIPHERAL connector pin 8, depending on AC adapter in use (12 VDC unregulated with factory AC adapter)
Current available to 5 V peripheral	+5 VDC @ 120 mA maximum at 25°C derate 12 mA for each AC adapter Volt above 9 VDC derate 1 mA for each °C above 25°C
Current available to 12 V peripheral	Factory provided AC adapter supplies unregulated 12 VDC @ 1 Amp
RS232 output levels	+10 VDC ± 1 VDC –10 VDC ± 1 VDC Maximum output impedance = 1100 Ω
RS232 input levels	± 30 V maximum Low threshold ≤ 0.8 V High threshold ≥ 3.5 V Input impedance at least 3000 Ω
9-pin inputs	Low ≤ 1 V; High ≥ 3.5 V
9-pin outputs	Low ≤ 0.5 V; High ≥ 3.5 V
Current drain	5 mA typical quiescent 10 mA maximum quiescent
Port Configuration	PC: 9-pin D-Subminiature Female configured as DCE. Peripheral: 9-pin D-Subminiature Female connects to peripheral through SC12 Two Peripheral Connector Cable supplied with the SC532A.
Dimensions	4 5/8 x 1 3/4 x 1 inches (allow up to 1 1/4 inches extra on 1 3/4 dimension for power connector strain relief)
Weight	1 1/4 pounds with AC adapter

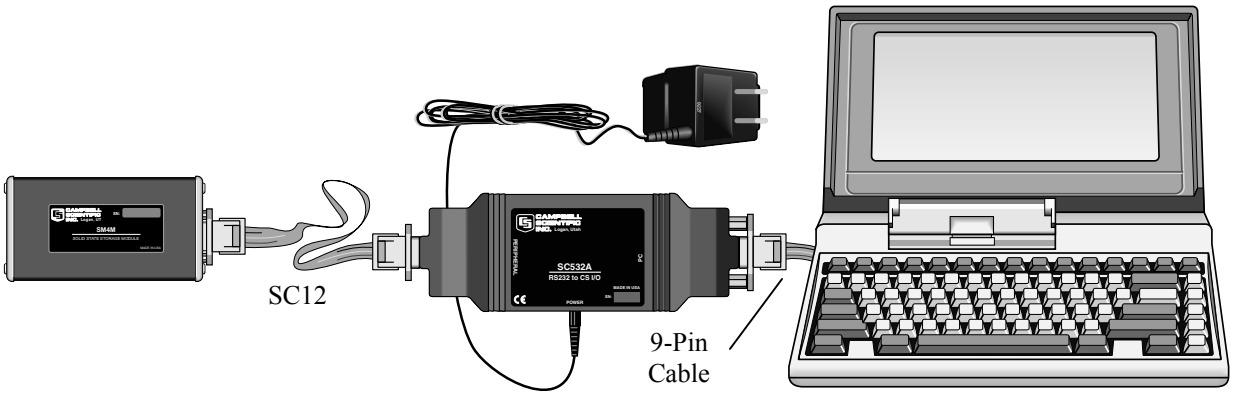


FIGURE 2. Connection Block Diagram (9-pin cable, side power jack)

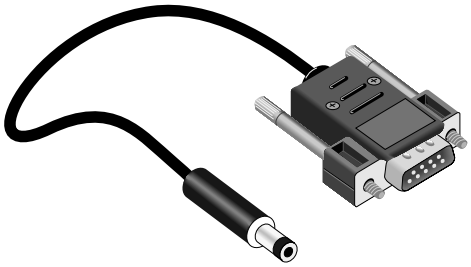


FIGURE 3. DC Cable for 12 VDC Datalogger Connection

4. Hardware Connections

Figure 2 shows the connection from a Campbell Scientific peripheral to a PC's 9-pin RS232 COM port via SC532A and data cables.

5. Operation

A CSI peripheral's logic levels (0V low, 5V high) are converted to RS232 levels (–10V and +10V respectively) by the SC532A.

The SC532A supplies regulated 5 VDC and unregulated 12 VDC power for peripherals. The factory-provided AC adapter plugs into a 120 VAC wall outlet.

You will need to write your own software if you are not using PC208 or PC208W Datalogger Support Software. Read the specific peripheral manual for the necessary control sequence.

Appendix A contains the SC532A and the DTE computer pin descriptions.

6. Portable Battery Power

The optional SC532A remote power/field cable (Item number 14020) can be used to power the SC532A from datalogger 12 VDC at remote sites. The field cable is equipped with a DB9 for connection to a CS I/O port.

For earlier dataloggers lacking 12 V on CS I/O port (check voltage between pin 8 and power ground), the field cable can be modified for datalogger 12 V terminals as follows:

1) Unplug field cable from SC532A and datalogger.

2) Cut off DB9 connector.

3) Remove cable sheath exposing positive (RED) wire and negative (BLACK) wire 2 inches back.

4) Strip ¼ inch of insulation from each wire.

5) Tin ends.

6) Connect RED wire to datalogger "12 V" terminal and BLACK wire to power ground terminal. The correct barrel connector polarity is (+) on the inner bore and (–) on the outer sleeve.

See Table 2 for the maximum operating currents required for selected CSI peripherals.

CAUTION

Before plugging power connector into SC532A, if you have 1) cut off optional field cable's DB9, 2) replaced the factory AC adapter, or 3) built your own dc power cable, make sure that the voltage polarity is correct on the coaxial (barrel) connector. Application of REVERSED POLARITY power to the SC532A can damage the SC532A, datalogger, and peripheral (not covered under warranty)!

Barrel connector inner bore (+)

Barrel connector outer sleeve (–)

The maximum POWER input voltage is 17 VDC!

TABLE 1. SC532A Power Supply Connector

Barrel Connector Polarity and Size

Inner Conductor (bore)	(+) 6 to 17 VDC (see Section 2)
Outer Conductor (sleeve)	(–) GND

O.D is 5.5mm (0.216 in.)
I.D. is 2.5mm (0.098 in.)
Sleeve length = 11.5mm (0.453 in.) or more

TABLE 2. CSI Peripherals and Their Maximum Operating Current Requirements

5 VDC Peripherals	Maximum Current
MD9 Multidrop Interface	< 90 mA
SM4M/16M Storage Module	< 100 mA
SM192/716 Storage Module	< 20 mA
SM64 Storage Module	< 30 mA
CSM1 Card Storage Module	< 18 mA
12 VDC Peripherals	**Maximum Current**
COM200 Modem	< 140 mA
COM300 Voice Modem	< 180 mA
Seimac Argos SDC Transmitter	< 700 mA

TABLE 3. SC532A Jumper Guide

P4 Jumper
A. **SC532** mode (factory default)
B. **PROG**ram Seimac SCD/Argos satellite transmitter

Appendix A. Pin Description

The SC532A 9-pin female port is configured as Data Communications Equipment (DCE) for direct cable connection to Data Terminal Equipment (DTE) such as an IBM-PC serial port.

The pin descriptions of the SC532A PC and PERIPHERAL connectors are listed in the following table.

TABLE A-1. SC532A Pin Descriptions

PIN = Pin number
I = Signal Into the SC532A
0 = Signal Out of the SC532A

PC CONNECTOR
9-PIN D-SUB FEMALE

PIN	I/O	DESCRIPTION
1	I	not used
2	O	RX
3	I	TX
4		DTR
5		GND
6		not used
7	I	RTS
8	O	not used
9	I	RING

PERIPHERAL CONNECTOR
9-PIN D-SUB FEMALE

PIN	I/O	DESCRIPTION
1	O	+5V SUPPLY
2		GND
3	I	RING
4	I	RX
5	O	ME
6	O	SDE EN
7	O	CLK/HS
8	O	+12V
9	O	TX

A PC configured as DTE, such as the IBM-PC, adheres to the description in Table A-2 or A-3

TABLE A-2. DTE 25 Pin Configuration

PIN= 25-pin number
ABR = Abbreviation for the function name
I = Signal Into the computer
O = Signal Out of the computer

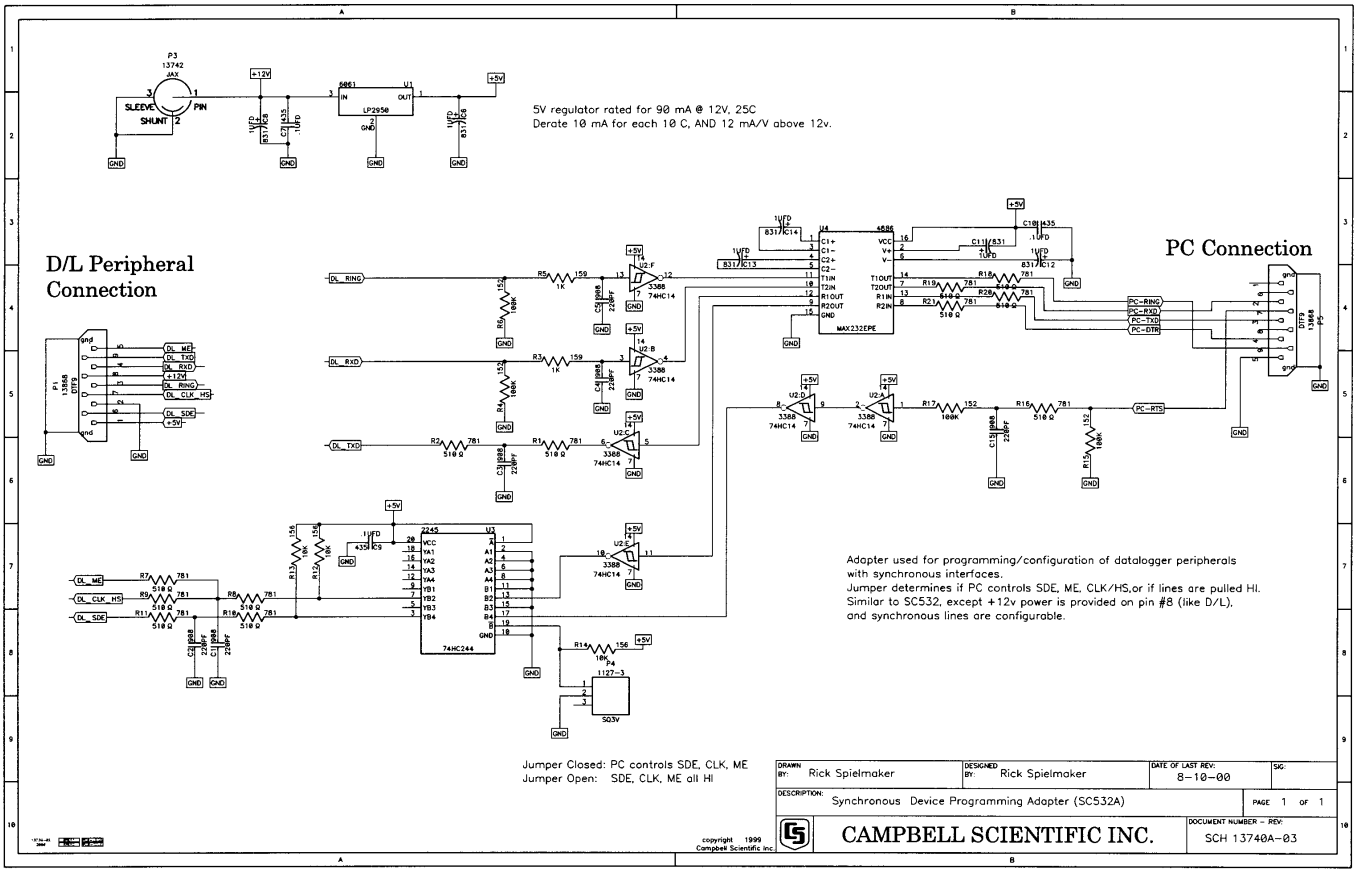
PIN	ABR	I/O	Function
1			Frame Ground.
2	TX	O	Transmit Data: Characters are transmitted from the computer on this line.
3	RX	I	Receive Data: Characters transmitted by a peripheral are received on this line.
4	RTS	O	Request To Send: The computer uses this line to control the peripheral's PE lines.
20	DTR	O	Data Terminal Ready: The computer uses this line to control the peripheral's ME and CLK/HS line.
22	RING	I	Ring Indicator: Raised to get the attention of the computer.
7	SG		Signal Ground: Voltages are measured relative to this point.

TABLE A-3. DTE 9 Pin Configuration

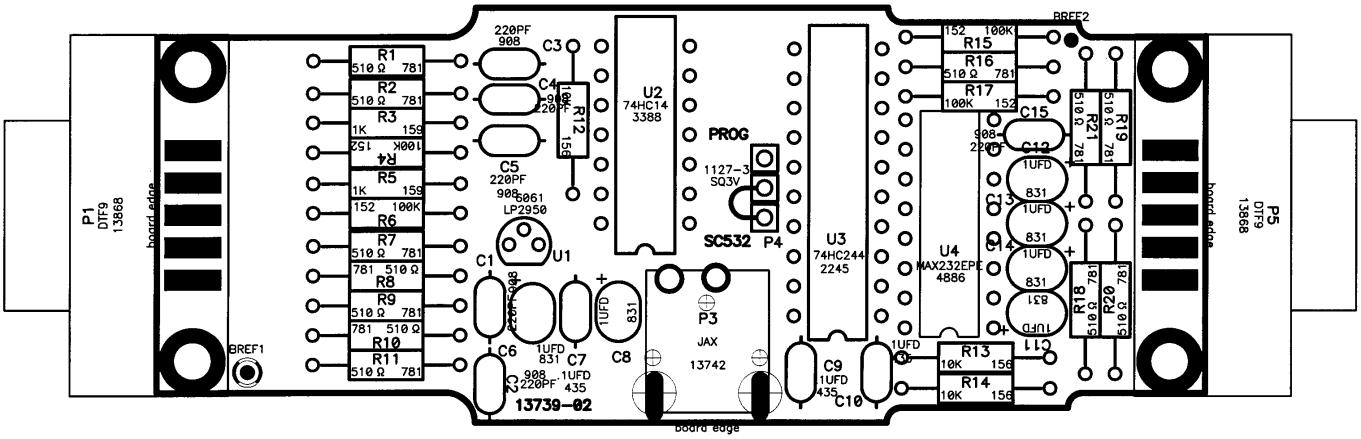
PIN = 9-pin number
ABR = Abbreviation for the function name
I = Signal Into the computer
O = Signal Out of the computer

PIN	ABR	I/O	Function
1	CD	I	Carrier Detect
2	RX	I	Receive Data
3	TX	O	Transmit Data
4	DTR	O	Data Terminal Ready
5	SG		Signal Ground
6	DSR	I	Data Set Ready
7	RTS	O	Request to Send
8	CTS	I	Clear to Send
9	RING	I	Ring Indicator

Appendix B. Schematic



Appendix C. Component Location



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