

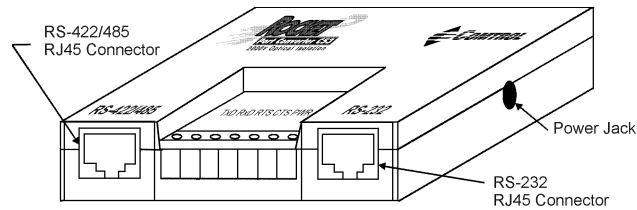


User Manual
Rocket Port Converter C52/C53

2000137 Rev B

Overview

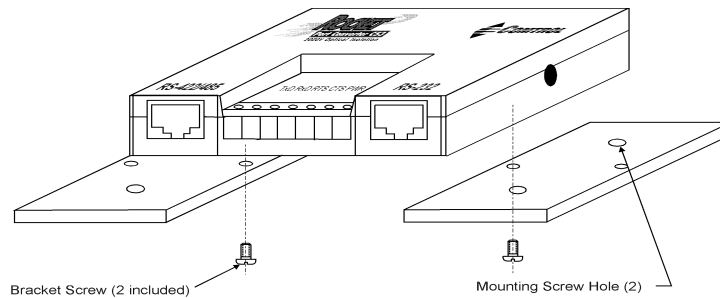
The Control Rocket Port Converters are smart RS-232 to RS-422/485 bi-directional converters. They allow you to convert one RS-232 port to and from either RS-422 or RS-485 ports. You use the converter to control devices with a longer than normal distance between the host and the device, and to communicate with several devices. Operations like point-to-point and multi-drop are available to meet your needs.



Rocket Port Converter C53

Features:

- Both the C52 and C53 are RS-232 to RS-422/RS-485 bidirectional converters. The C53 includes isolation protection against high voltage up to 2000V.
- Control locates the switch settings inside the converter. This protects the system from unintentional changes that would introduce communication errors without any warning. To make any changes to the operation mode, simply remove the two screws to open the cover.
- You can power the C52/C53 either from a DC +9V to +30V, 150A power adapter, or the pin 6 and pin 7 on the terminal block.
- LED indicators show the status of transmitting and receiving data, RTS signal, and power.
- Control has added a protect resistor inside the unit to avoid over-current from the remote ground to the converter's ground.
- Mounting Kit lets you mount the C52/C53 on a wall or any surface.



Specifications

C52/C53	Specification
Current consumption:	C52 - DC +9V to +30V, 150mA max. C53 - DC +9V to +30V, 270mA max.
Baud rate:	Up to 921.6K bps under 500 feet (0.15Km)
Distance	Up to 4000 feet (1.2 Km) under 115200 bps
<i>Note: Baud rate is dependent upon hardware and operating system configuration.</i>	
Optical isolation C52	No
C53	2000V DC for all signals
Surge protection	25KV ESD for all signals
Dimension	90mm x 60mm x 21mm

Environmental Condition	Value
Operating Temperature	0 to 55°C

Electromagnetic Compliance	Status
Emissions: RFI Emissions: Class A EN 55022 FCC Part 15: Class A	Yes
Immunity: EN 50082-1	Yes

Package Check List

C52 (C53) RS-232 to RS-422/RS-485 bidirectional converter

Power adapter

Cable

Mounting kit

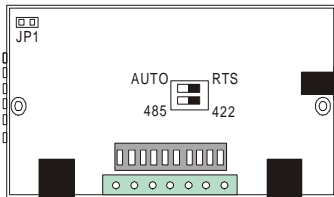
User manual

Installation

1. The RS-232 and RS-422-485 ports are labeled clearly on the surface of the C52 and C53 converters. Prepare the RS-232 cable and decide the operation mode as well as the 2/4-wire cable in advance. See the RS-232 Cable Wiring and Operations sections.

If you need to change the operation mode, remove the two screws on top of the converter and open the cover. Change the switches to reflect your desired mode.

The DIP switches set the operation mode (RS-422 or RS-485) and the control mode (by RTS or ADDC) for RS-485 mode.



Switch settings tables of Switch 1 and Switch 2 are as follows:

Switch 1	
RS-422 mode	Off
RS-485 mode	On

Switch 2	
By RTS	Off
Auto Data Direction Control (ADDC)	On

2. When you are using the RS-485 in a multi-drop mode, Control includes one jumper per unit to enable the termination resistor. You only enable the jumper (JP1) at the extreme ends of the chain.

In the RS-422 mode, the RxD always enables a 120 Ohm terminating resistor.

LED Indicators

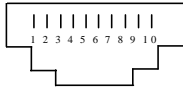
There are LED indicators for TxD, RxD, RTS, and PWR on top of the unit. The indicators are not on when the unit is not connected with a signal or power.

- The TxD indicator stands for transmitted data from RS-232 to RS-422 or RS-485. It illuminates when connected and data is transmitting.
- The RxD indicator stands for received data from RS-422 or RS-485 to RS-232. It illuminates when connected and receiving data.
- The RTS indicator is for the RS-232 RTS signal (Request To Send). It illuminates when it is connected and the RTS signal is on.
- The PWR indicator illuminates when the power is on and not lit when the power is off or not connected.

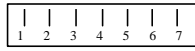
RS-422/RS-485 Pinouts

The RS-422/RS485 interface with the RJ45 Jack connector or Terminal Block Connector is shown as follows:

R J - 4 5 C o n n e c t o r



T e r m i n a l B l o c k C o n n e c t o r



C52/C53 RS-422

RJ45 Jack		Terminal Block	
Connector Pinouts	Signals	Connector Pinouts	Signals
1	TxD-(A)	1	TxD+(B)
2	RTS-(A)	2	TxD-(A)
3	RTS+(A)	3	RxD+(B)
4	Signal GND	4	RxD-(A)
5	TxD+(B)	5	Signal GND
6	RxD+(B)	6	Power GND
7	Signal GND	7	VCCA(9v)
8	CTS+(B)		
9	CTS-(A)		
10	RxD-(A)		

C52/C53 RS-485

RJ45 Jack		Terminal Block	
1	Data-(A)	1	Data+(B)
2	nc	2	Data-(A)
3	nc	3	nc
4	Signal GND	4	nc
5	Data+(B)	5	Signal GND
6	nc	6	Power GND
7	Signal GND	7	VCCA(9V)

Note: Pin 6 and Pin 7 of the Terminal Block are for Power GND and Power Input, which is an alternate option for the power adapter. Be careful that you DO NOT confuse the RS-422/RS-485 (Signal) GND with the power GND.

Operation

The C52/C53 supports four kinds of operations. They are:

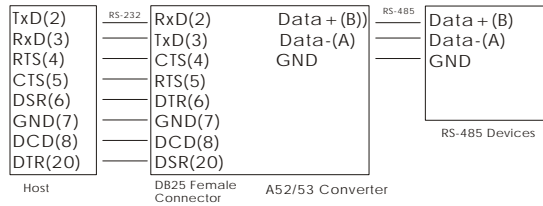
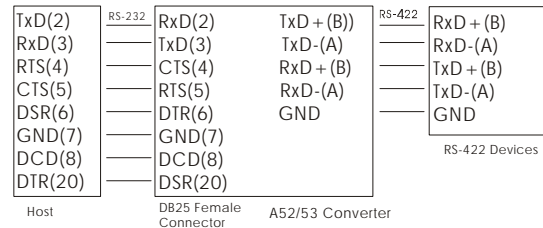
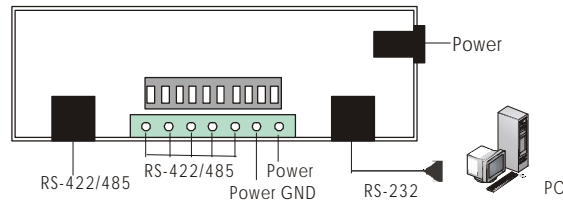
- Point-to-point, 4-wire full duplex
- Point-to-point, 2-wire half duplex
- Multidrop, 4-wire full duplex
- Multidrop, 2-wire half duplex

Note: If possible, connect the GND of both sides together to gain better signals. For example, you may need one more GND connection in addition to the 4-wire or 2-wire connections.

Note: For C53, connect the GND at the terminal block to the earth ground to provide a ground path to prevent electric shock caused by lightning, no matter whether you use the RJ45 or terminal block RS-422/RS-485.

Basic Communication Wiring

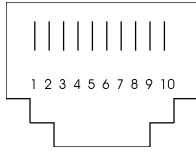
Before placing a converter in an existing network, you should configure it. The following diagrams show a typical layout for both converters.



Reference Section

RS-232 Pinouts

The following depicts the RS-232 interface with the RJ45 connector.



C52/C53 RJ45 Connector Pinouts	RS-232 Signals
1	DCD Always On
2	DTR
3	CTS
4	GND
5	RxD
6	TxD
7	GND
8	RTS
9	DSR
10	-----

Note: The DTR and DSR pins have been shorted. This releases the users from the hardware flow control wiring problems. Therefore, only two types of RS-232 cable wiring examples are listed in the following.

RS-232 Cable Wiring

Type 1: To connect the RS-232 side of a C52 or C53 to a DTE (Data Terminal Equipment or “your PC”) or DCE (Data Communications Equipment or “remote device”). Check the precise DTE/DCE pinouts. For an example, see the following DTE/DCE pinout examples.

C52/C53 to DTE Cable

	<u>Signal</u>	<u>Pin</u>	_____	<u>Pin</u>	<u>Signal</u>	
RJ45	DCD	1	_____	8	DCD	DB-25 Male
	DTR	2	_____	20	DSR	
	CTS	3	_____	5	RTS	
	RxD	5	_____	3	TxD	
	TxD	6	_____	2	RxD	
	GND	7	_____	7	GND	
	RTS	8	_____	4	CTS	
	DSR	9	_____	6	DTR	

C52/C53 to DTE Cable

	<u>Signal</u>	<u>Pin</u>	_____	<u>Pin</u>	<u>Signal</u>	
RJ45	DCD	1	_____	1	DCD	DB-9 Male
	DTR	2	_____	4	DSR	
	CTS	3	_____	8	RTS	
	RxD	5	_____	2	TxD	
	TxD	6	_____	3	RxD	
	GND	7	_____	5	GND	
	RTS	8	_____	7	CTS	
	DSR	9	_____	6	DTR	

C52/C53 to DCE Cable

	<u>Signal</u>	<u>Pin</u>	_____	<u>Pin</u>	<u>Signal</u>	
RJ45	DCD	1	_____	8	DCD	DB-25 Female
	DTR	2	_____	6	DSR	
	CTS	3	_____	4	RTS	
	RxD	5	_____	2	TxD	
	TxD	6	_____	3	FxD	
	GND	7	_____	7	GND	
	RTS	8	_____	5	CTS	
	DSR	9	_____	20	DTR	

Type 2: To connect the RS-232 side of a C52 or C53 to a DTE (Data Terminal Equipment or "your PC") with a 3-pin wiring if you don't require hardware flow control.

C52/C53 to DTE Cable

	<u>Signal</u>	<u>Pin</u>		<u>Pin</u>	<u>Signal</u>	
RJ45	TxD	5	—————	3	RxD	DB-25 Male
	RxD	6	—————	2	TxD	
	GND	7	—————	7	GND	
	RTS	8		5	CTS	
	CTS	3		4	RTS	
	DSR	9		20	DTR	
	DTR	2		6	DSR	
	DCD	1		8	DCD	

C52/C53 to DTE Cable

	<u>Signal</u>	<u>Pin</u>		<u>Pin</u>	<u>Signal</u>	
RJ45	TxD	6	—————	2	RxD	DB-9 Male
	RxD	5	—————	3	TxD	
	GND	7	—————	5	GND	
	RTS	8		8	CTS	
	CTS	3		7	RTS	
	DSR	9		4	DTR	
	DTR	2		6	DSR	
	DCD	1		1	DCD	

C52/C53 to DCE Cable

	<u>Signal</u>	<u>Pin</u>		<u>Pin</u>	<u>Signal</u>	
RJ45	TxD	6	—————	2	RxD	DB-25 Female
	RxD	5	—————	3	TxD	
	GND	7	—————	7	GND	
	RTS	8		4	CTS	
	CTS	3		5	RTS	
	DSR	9		6	DTR	
	DTR	2		20	DSR	
	DCD	1		8	DCD	

Impedance Matching and Termination Resistors

When an electrical signal travels through two different resistance junctions in a transmission line, the mismatch will sometimes cause signal reflection. Signal reflection causes signal distortion, which in turn will contribute to communication errors. The solution to this problem is to establish the same impedance at the RS-485 line ends as in the line itself by terminating them with resistors.

Control manufactures the converter with jumpers to enable and disable termination resistors. To set the jumper, remove the two screws in the cover and set the jumper to cover both pins.

Troubleshooting

If installation fails or you are trying to resolve a problem, you should try the following before calling the Control technical support line:

For data transmission failure:

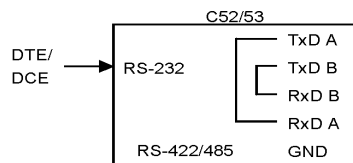
- Check that you are using the correct power adapter.
- Check that switches 1 and 2 are properly set.

For data loss or error:

Check that the data rate and data format are the same for both devices

Self Test

This configuration is for C52/C53 self test. Run the terminal emulation program to see if what you received is what you typed.



In the graph, Tx D A, Tx D B, Rx D A, and Rx D B could be either from RJ45 or the terminal block.

FCC Notices

Radio Frequency Interference (RFI) (FCC 15.105)

This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

This equipment complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Control Corporation may void the user's authority to operate this equipment.

Serial Cables (FCC 15.27)

This equipment is certified for Class A operation when used with shielded cables.

Contacting Technical Support

Control has a staff of support technicians available to help you. Before you call, please have the following information available:

Control product model number: _____

Serial number: _____

Operating system type and release: _____

Computer make: _____

Computer model: _____

Processor speed: _____

Control Corporate Headquarters:

- Web site: <http://www.control.com>
- E-mail: support@control.com
- FAX: (763) 494-4199
- Tel: (763) 494-4100
- FTP site: <ftp://ftp.control.com>

Control UK Technical Support

- Web site: <http://www.control.co.uk>
- E-mail: support@control.co.uk
- FAX: +44 (0) 1 869-323-211
- Tel: +44 (0) 1 869-323-220

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Notes: