



## DEL MOTORIZED SOLUTIONS

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# R2D7 V4.1 Protocol

<i>Serial Port to BUS (RP Receivers)</i>		
<i>Information</i>	<i>Data</i>	<i># of characters <sup>1</sup></i>
Header (Start of command)	* (asterisk) for use on BUS to control RP	1
Subsystem number or Administration command	0 <sup>2</sup> – 7 if BUS, 7 – 99 if Radio V <sup>3</sup> = report version R = make port 7 Radio <sup>4</sup> B = make port 7 BUS	1 or 2
Command <sup>5</sup>	o = open c = close s = stop w = wind p = program RP a = program accessory q <sup>6</sup> = quit sending	1
Channel <sup>7</sup>	00 <sup>8</sup> – 60 <sup>9</sup>	2
Time to send <sup>10 11</sup>	0 0 0 <sup>12</sup> – 9 9 9 20 <sup>th</sup> of seconds <sup>13</sup> (this value is optional)	3
Terminator	;(semicolon) or "CR" (enter key)	1
Pause	Send a command on an unused channel for the desired pause time.	

<i>BUS to Serial Port</i>	
<i>Event</i>	<i>R2D7 sends</i>
Powered up	"version <sup>3</sup> , X-on"
Terminator is received	"LF" if good command "U" sent if command cannot be understood "CR" is sent After command has been relayed to motors
Buffer <sup>14</sup> overflows and all data is purged	"O" is sent
Buffer <sup>14</sup> is half full	"X-off" (Ctrl-S)
Buffer <sup>14</sup> is empty	"X-on" (Ctrl-Q), but only if X-off was previously sent

Please refer to the "R2D7 Installation Guide" document for additional information including command examples.

<sup>1</sup> Total message length may be as short as 2 and as long as 10 characters, typically 6

<sup>2</sup> 0 means ALL systems (for super groups) ALL does not include the radio channels

<sup>3</sup> Version reports "4.1" then r if administered as Radio, or b if BUS, followed by carriage return (please note that all characters after V in this command are ignored)

<sup>4</sup> Radio requires a RFTM be plugged into port 7 jack without batteries

<sup>5</sup> Case is not important: s is the same as S and so on

<sup>6</sup> Stop sending a forever command. Any other command will stop transmission, but an error will be reported

<sup>7</sup> If command is stop or quit, then this value is optional and ignored

<sup>8</sup> 00 = ALL

<sup>9</sup> 60 sometimes called "cut strap ALL"

<sup>10</sup> If no digits, then the command is sent for 2 seconds, except for stop, program, or wind which are sent for ¼ second

<sup>11</sup> Time between commands = .75 sec if multiple commands are buffered (Time = .1 sec after a stop)

<sup>12</sup> 000 = Forever, use the q command to stop transmission

<sup>13</sup> Max timed pulse = 50 sec. If this is a radio command, the value is rounded up to the nearest 10<sup>th</sup> second

<sup>14</sup> Buffer is 256 bytes long



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### R2D7 V4.1 Protocol

<i>Special characters</i>		
<i>Character</i>	<i>Description</i>	<i>ASCII Character Number</i>
" ; "	Semicolon, signifies end of command	59 (0x3B)
" CR "	Carriage return, signifies end of command	13 (0x0D)
" * "	Asterisk, Shift 8 on most keyboards	42 (0x2A)
" LF "	Line feed, ignored (not used)	10 (0x0A)
" X-off "	Ctrl-S on most keyboards, requests sender to stop sending	19 (0x13)
" X-on "	Ctrl-Q on most keyboards, requests sender to resume sending	17 (0x11)

***Example strings:***

System 1 Close ALL for default 2 seconds: **\*1c00;**

System 2 Open ALL for default 2 seconds: **\*2o00;**

System 3 Close 5 for .75 seconds (momentary shade possibly): **\*3c05015;**

System 4 Open 9 for 5 seconds: **\*4o09100;**

System 5 Close 23 for default 2 seconds: **\*5c23;**

System 6 Open 49 for .25 seconds (momentary shade possibly): **\*6o49005;**

System 7 Close 60 for default 2 seconds: **\*7c60;**

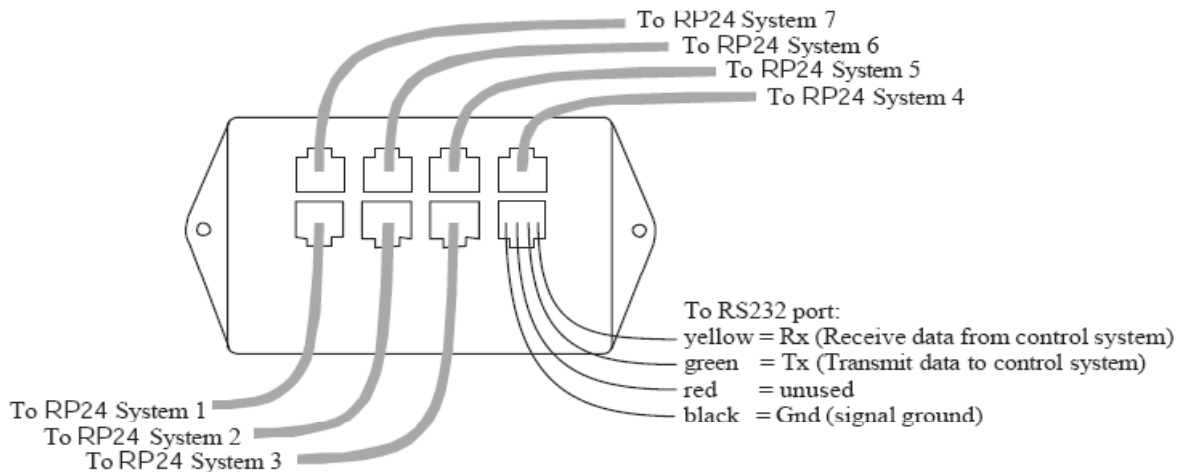
All Systems Open 21 for default of 2 seconds: **\*0o21;**



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## R2D7 Installation Guide

RS232 Port setup: 9600 8N1.



Note that System 1 **must** be connected to the eye port on a functional RP<sub>xx</sub> for this unit to operate, all other system ports may be left unconnected.

The protocol is described in "R2D7 Protocol" document. The end of command character is ";", a semicolon..

If you want to emulate the momentary action currently available using a transmitter with an RP<sub>xx</sub> in momentary mode, then put the desired RP<sub>xx</sub>'s in momentary action, and use the following sequence (assuming system 1, channel 23, tilting open):

**Using ; as the End of Command**

When the button is pressed, send \*1o23000; the R2D7 will begin sending "OPEN23" commands  
 When the button is released, send \*1q; the R2D7 will stop sending when ; is received

**Using <CR> as the End of Command**

When the button is pressed, send \*1o23000<CR> the R2D7 will begin sending "OPEN23" commands  
 When the button is released, send \*1q<CR> the R2D7 will stop sending when ; is received

The RP<sub>xx</sub> will respond appropriately by tilting if short button, latching if held longer than 1.5 seconds.

This method is recommended if an IR transmitter is used in conjunction with the control system.

(If the RP<sub>xx</sub> is placed in "Stop on Transmitter Button Release" mode, then motor will run as long as the button is held)

Another method to accomplish this action is put the RP<sub>xx</sub> in maintained action:

When the button is pressed, send \*1o23002; the R2D7 will send "OPEN23" for .1 seconds

When the button is released, send \*1s; the R2D7 will send "STOP"

The RP<sub>xx</sub> will respond by running as long as the button is held.

If the "time to send" value is not sent, then the R2D7 will send the command for 2 seconds. This guarantees the action happens even if the motor is already moving or if it is "momentary action." Stop command is sent for .25 seconds.

A large "scene" can be created by using the ALL systems command. I.E., all motors in group 14 on all systems can be simultaneously opened by sending \*0o14;



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Complex scenes can be achieved by putting the RP<sub>xx</sub>'s in "Stop on Transmitter Button Release" mode. The motors will run as long as commands are sent. Use the R2D7 to send timed commands to put the motors at desired locations. Make sure that all motors are fully closed (or open) before doing timed runs!

The RS232 port on the R2D7 interface can be wired with only 2 wires if you choose to ignore the feedback information. This means that the control system programmer must make sure that the buffer never overflows, and that all messages are correctly formatted.

A scene can be sequenced using the R2D7 by sending timed commands with pauses created by sending timed command to an unused channel. This effect can also be done by timing commands inside the control system program.

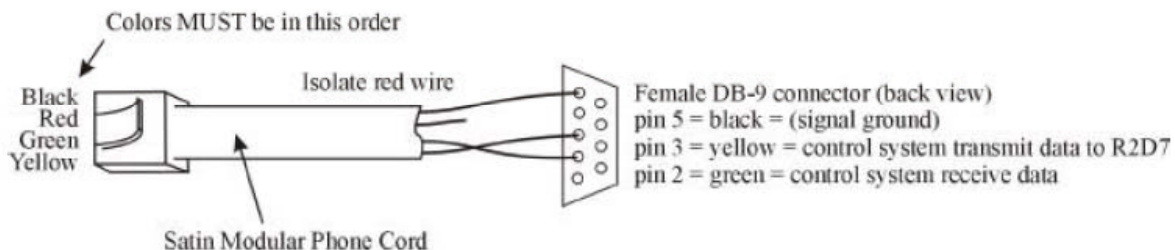
The R2D7 internal buffer is 120 bytes long. If the buffer reaches half full, then X-off is sent, and the control system is expected to stop sending commands. In this state, when the last message is read out of the buffer, X-on is sent and the control system may resume sending commands. If the buffer overflows, then an upper case "O" is sent back and ALL commands are thrown away and the buffer is cleared. If the control system keeps sending commands during this time, the first one will probably be bad, and the next valid command will be acted upon.

Any command received by the R2D7 that does not conform exactly to the protocol, or if any number is out of range, then an upper case "U" is sent back and that command is thrown away.

Between every command there is a forced delay of ½ second. This allows the RP<sub>xx</sub>'s time to get ready for the next command. (After a stop, the forced delay is only .1 sec.)

When a valid command is received, the R2D7 sends back "LF" to acknowledge the command. It then begins sending the desired command over the IR link. When the timed command is completed, the R2D7 sends "CR" to indicate that it has completed that command and is ready for the next one.

A typical cable for connecting to a Home Automation System is as shown:



### Special characters:

“;” signifies end of command and can be used in place of “CR”. “;” corresponds to ASCII character number 59 (0x3B)  
“CR” or <CR> signifies end of command and can be used in place of “;”. “CR” corresponds to ASCII character number 13 (0x0D).

“LF” signifies “line feed” and is ignored by the R2D7. “LF” corresponds to ASCII character number 10 (0x0A).

“\*” signifies start of command and corresponds to shift 8 on most keyboards, ASCII character number 42 (0x2A).

“X-off” (Ctrl-S on most keyboards) requests sender to stop sending, ASCII character number 17 (0x11).

“X-on” (Ctrl-Q on most keyboards) requests sender to resume sending, ASCII character number 19 (0x13).