

Revision 2.3

8/01/06

1. INTRODUCTION

This protocol applies to RCS relay control units that are designed for use on the RCS CommStar RS485 device networks. Relay control units can have up to 8 relay channels each. Each relay channel can be individually controlled by network commands for latched on/off or pulsed operation. Each control unit can be addressed from 1 to 127. WinEVM supports up to 16 relay control units for a total of 128 relays.

2. COMMUNICATIONS

Commstar RS485 network communications are half duplex, 2 wire, D+ and D- (plus ground wire). Network wiring is recommended to be twisted pair, such as Cat 3 or 5. Typical max line length is 4000 ft. Terminating resistors (120 Ohm) may be required for long lines for optimum noise immunity. Determine your network termination requirements according to the network topology used.

Communications settings: 9600 baud, 8 data bits, 1 stop bit, no parity and no flow control.

3. COMMAND STRUCTURE

The CommStar communications protocol is an ASCII based protocol. The command strings are ASCII characters from 5 to 7 bytes in length. Commands are case sensitive.

The first byte is the start of message byte. The start byte is always the ASCII character “!” for commands without checksums or “#” if checksums are used.

The second and third bytes are the device type “R8”.

The fourth and fifth bytes are the address bytes, which range from “00” to “7F”.

Note: Address “00” is reserved for global commands.

The sixth byte is the command character as shown in the table below, these bytes are ASCII characters and are used to specify which command will be executed by the Control Unit.

Some commands require an argument field containing a seventh and eighth data byte.

All commands are terminated with a carriage return [cr]. All responses start with “\$R8”.

4. COMMAND SUMMARY**! Commands without Checksums:**

Command	Message format	Return Value	Comments
Set All Relays	!R8aaWyy[cr]	\$R8aa	yy is relay state, bit encoded hex
Set 1 Relay	!R8aaLxy[cr]	\$R8aa	x is relay 0-7, y is state 0(Off) or 1(On)
Pulse 1 Relay	!R8aaPxzzzz[cr]	\$R8aa	x is relay 0-7, zzzz is seconds in hex, 3240 max (0x0CA8)
Query Relays*	!R8aaQ[cr]	\$R8aaQyy[cr]	yy is relay value bit encoded hex High bit = 8, low bit = 1 yyyy yyyy = 8765 4321 relay sequence
Read Version	!R8aaV[cr]	\$R8aaPvv[cr]	returns ‘P’ powerup command after 1 st query
UnConfigure	!R8aar[cr]	\$R8aa	vv is version, 00-FF puts controller into unconfigured state, same state as after a powerup condition

aa = address, 0x01=0x00x7F, 0x00 is a global address.

Commands with Checksums:

Command	Message format	Return Value	Comments
Set All Relays	#R8aaWyycc[cr]	\$R8aa	yy is relay state, bit encoded hex
Set 1 Relay	#R8aaLxycc[cr]	\$R8aa	x is relay 0-7, y is state 0(Off) or 1(On)
Pulse 1 Relay	#R8aaPxzzzzcc[cr]	\$R8aa	x is relay 0-7, zzzz is seconds in hex, 3240 max (0x0CA8)
Query Relays*	#R8aaQcc[cr]	\$R8aaQyycc[cr]	yy is relay value bit encoded hex
Read Version	#R8aaVcc[cr]	\$R8aaPvvcc[cr]	returns 'P' powerup command after 1 st query
UnConfigure	#R8aarcc[cr]	\$R8aavcc[cr]	vv is version, 00-FF
		\$R8aacc	puts controller into unconfigured state, same state as after a powerup condition

cc = checksum

Checksum calculation:

Starting with the leading “#” character, add the ASCII value of every character in the message string up to but not including the checksum and carriage return.

* First Query Response

The first Query command received after a powerup or “UnConfigure” command will return the ‘P’ powerup response followed by version information. Ex: \$R8aaPvv(cr), where vv is firmware version number.

After the first query, the standard Query response is returned. Ex: \$R8aaQyy