

Room Controller Network Serial Integration

Overview

Third party systems are able to send serial commands to Room Controller Network lighting control panels. These serial commands are sent using the TCP/IP protocol over the building LAN to an Ethernet Interface Module (EIM) or ControlKeeper M (CKM) panel. The EIM or CKM will then forward the serial commands onto the lighting control system RS-485 network.

Serial integration can be used to allow AV, BMS or other systems to send commands to the Room Controller Network panels and set dimmer levels, relay states or trigger remote commands.

Command Types

Supported Commands

Manual Commands	Relay (On/Off)
Dimmer Commands	Dimmers (0 – 100%)
Remote Commands	Remote (On/Off)

Disclaimer

This document defines the implementation of the Eaton Lighting Systems RS232 and network protocol used by the Room Controller products. The specifications, descriptions and information provided here are believed to be correct at the time of printing. However, specifications are continually being upgraded and are subject to change without notice. Eaton Lighting Systems shall not be liable for technical or editorial omissions made herein; nor for incidental or consequential damages resulting from the furnishing, performance or use of this material.

Connection

The Room Controller Network system connects to the Building LAN via an Ethernet Interface Module (EIM). The system requesting serial integration must also connect to the Building LAN and be able to make a TCP connection to the EIM. Consult your local IT expert to insure proper IP routing can be achieved.

The Ethernet Interface Module must be properly configured and installed. Consult the EIM installation instructions shipped with the unit or via the web site.

http://www.cooperindustries.com/content/dam/public/lighting/controls/products/documents/greengate/instruction_sheets/eim_install.pdf

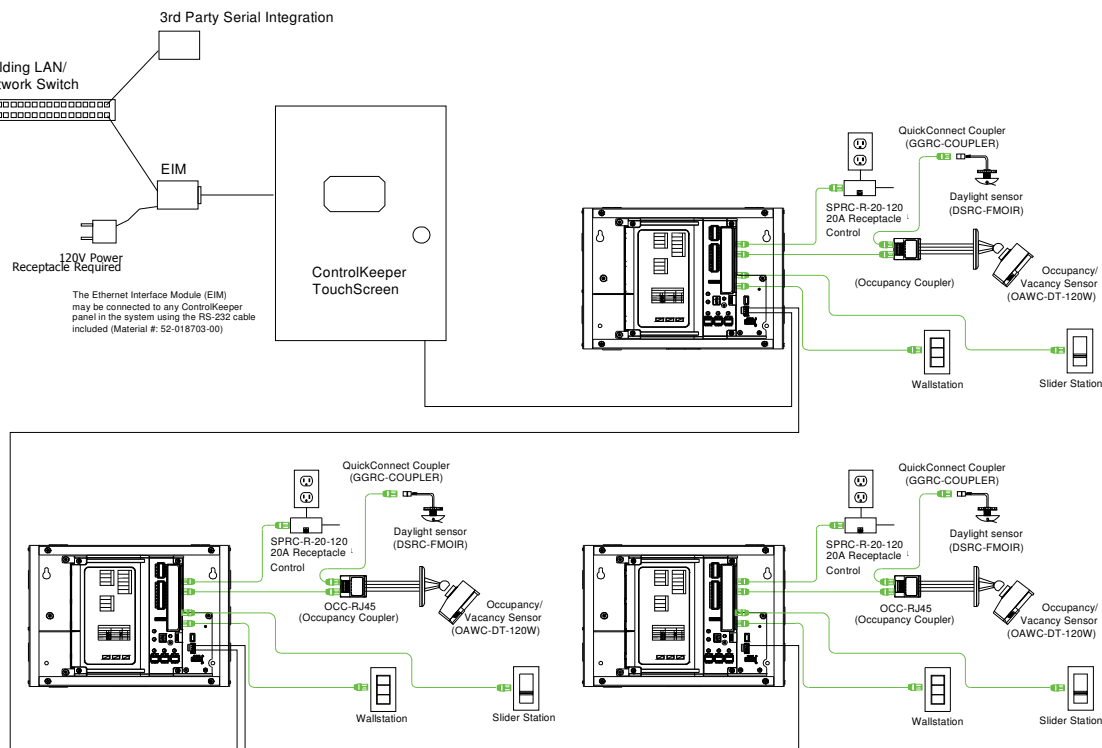


Figure 1: Room Controller Network Serial Integration Connection

Packet Format

Packet: [Flag] [Length] [Physical To Address] [Physical From Address] [To/From Address] [Type Flag]
[DATA] [LRC]

Flag: (1 byte) All data information coming from any external device must be preceded by an AA hexadecimal (170 decimal). If the incoming information is not preceded by the AA hex then the information will be ignored by the Room Controller Network.

Length: (1 byte) This byte informs the LCP receiving the message of the number of bytes following this byte up to and including the LRC.

Physical TO Address: (1 byte) This byte is the address of the LCP (in hexadecimal) that this message is for. All LCP's have hardware which allows them to reside at a certain "logical" address. This address range is from 1 to 254. Only the LCP at this specific address will listen to the message. Please note that address 0 and 255 should not be used.

Physical FROM Address: (1 byte) The byte for the Physical FROM Address field is always zero (00).

Logical TO/FROM Address: (1 byte) Transmissions entering the panel RS232 port will always be zero (00) for this field.

Type Flag: (1 byte) The type flag defines the exact function of the data being transmitted. The supported type flags are described below.

DATA: (N bytes) The variable-length field associated with each Command field is detailed in section 5 "Command Types Flag".

LRC: The (1 byte) Linear Redundancy Check (LRC) is an XOR of all the bytes in the frame transmission including the flag character, up to but not including the LRC byte. This byte is used to check for valid transmissions of data to the Lighting Control Panel. The calculation for the LRC is shown below:

```
lrc = 0;
for ( index = 0; index < message length; index = index + 1 )
{
    lrc = lrc XOR data[ index ];
}
```

Type Flags

The command Type Flag defines the type of protocol packet to be sent to the LCP. The type number is in hexadecimal.

Type Flag	Description
Type 02	Remote Command
Type 03	Manual Command
Type 0E	Dimmer Command

Type 02 - Remote Command

In a Room Controller Network, remote commands are used to send preset commands to the Room Controller. Remotes can trigger allow groupings of relays within the controller or controllers to respond to a single command. The status field returned will include some indication of whether or not the controller could perform the requested function with 1=OK and 0=not done.

Function	Type	Remote Name	Remote State	ACK Status
Remote Command	02	8 Byte Hex Name	02 = OFF 03 = ON	
Remote Acknowledge	02	8 Byte Hex Name	02 = OFF 03 = ON	1 = OK 0 = No remote by this name

Remote Command Examples

Below are some examples of the use of remote commands. The examples are listed in hexadecimal.

“FF” in the Physical To Address field is a Global and will be sent to all lighting control panels on the network. When “FF” is in the Physical To Address field no Acknowledgement is sent from the panels. If a Remote Command is sent to a specific panel address a Remote Acknowledgement is sent.

Remote **ON** Command
Name

OFF Command

TIM3	AA 0E FF 00 00 02 [54 49 4D 33 20 20 20 20] 03 39	AA 0E FF 00 00 02 [54 49 4D 33 20 20 20 20] 02 38
------	---	---

NOTE: The LRC of each transmission will be different based on the panel address and data information changes. See the calculating LRC section for examples.

Type 03 - Manual Command

This is used to command a single digital output (relay) on the network to an ON or OFF state. This command is sent to the relay name.

Function	Type	Relay Name	Relay State	ACK Status
Relay Command	03	8 Byte ASCII Hex Name	01 = ON 02 = OFF	
Relay Acknowledge	03	8 Byte ASCII Hex Name	01 = ON 02 = OFF	1 = OK 0 = No relay by this name

Manual Command Examples

Below is an example of a manual relay commands to Room Controller Network panel address #1. The example is listed in hexadecimal.

Relay #	ON Command	OFF Command
Relay 1	AA 03 01 00 00 03 [52 65 6C 61 79 20 31 20] 01 D5	AA 03 01 00 00 03 [52 65 6C 61 79 20 31 20] 02 D4
Relay 2	AA 03 01 00 00 03 [52 65 6C 61 79 20 32 20] 01 D6	AA 03 01 00 00 03 [52 65 6C 61 79 20 32 20] 02 D7
Relay 3	AA 03 01 00 00 03 [52 65 6C 61 79 20 33 20] 01 D7	AA 03 01 00 00 03 [52 65 6C 61 79 20 33 20] 02 D6

NOTE: The LRC of each transmission will be different based on the panel address and data information changes. See the calculating LRC section for examples.

Type 0E - Dimmer Commands

This is used to command a single dimmer level within a Room Controller on the network to a % light level (0-100%). This command is sent to the dimmer name.

Function	Type	Dimmer Name	DB	Point	Static Fields	% Output
Dimmer Command	0E	8 Byte Hex Name	01	06=Dim1 07=Dim2 08=Dim3	00 04 01 08 00 00 00 00 00 00 00	1 Byte Hex
Dimmer Acknowledge	0E	8 Byte Hex Name	01	06=Dim1 07=Dim2 08=Dim3	00 04 01 08 00 00 00 00 00 00 00	1 Byte Hex plus 01 = OK

Dimmer Command Examples

Below are examples of a manual dimmer commands to Room Controller Network panel address # 218. The example is listed in hexadecimal.

Dim #	Command	% Dim Level
Dim 1	AA 1B DA 00 00 0E [44 69 6D 20 31 20 20 20] 01 06 00 04 01 08 00 00 00 00 00 00 00 32 2C	50%
Dim 2	AA 1B DA 00 00 0E [44 69 6D 20 32 20 20 20] 01 07 00 04 01 08 00 00 00 00 00 00 00 19 05	25%
Dim 3	AA 1B DA 00 00 0E [44 69 6D 20 33 20 20 20] 01 08 00 04 01 08 00 00 00 00 00 00 00 64 76	100%

NOTE: The LRC of each transmission will be different based on the panel address and data information changes. See the calculating LRC section for examples.

ASCII Chart

Below is a sample ASCII chart showing the relationship between the ASCII value, HEX value and Decimal value.

Dec	Hex	Oct	Bin	Char	Dec	Hex	Oct	Bin	Char	Dec	Hex	Oct	Bin	Char	Dec	Hex	Oct	Bin	Char
0	0x00	000	00000000	NUL	32	0x20	040	01000000	space	64	0x40	100	10000000	@	96	0x60	140	11000000	`
1	0x01	001	00000001	SOH	33	0x21	041	01000001	!	65	0x41	101	10000001	A	97	0x61	141	11000001	a
2	0x02	002	00000010	STX	34	0x22	042	01000010	"	66	0x42	102	10000010	B	98	0x62	142	11000010	b
3	0x03	003	00000011	ETX	35	0x23	043	01000011	#	67	0x43	103	10000011	C	99	0x63	143	11000011	c
4	0x04	004	00000100	EOT	36	0x24	044	01000100	\$	68	0x44	104	10000100	D	100	0x64	144	11000100	d
5	0x05	005	00000101	ENQ	37	0x25	045	01000101	%	69	0x45	105	10000101	E	101	0x65	145	11000101	e
6	0x06	006	00000110	ACK	38	0x26	046	01000110	&	70	0x46	106	10000110	F	102	0x66	146	11000110	f
7	0x07	007	00000111	BEL	39	0x27	047	01000111	'	71	0x47	107	10000111	G	103	0x67	147	11000111	g
8	0x08	010	00010000	BS	40	0x28	050	01010000	(	72	0x48	110	10010000	H	104	0x68	150	11010000	h
9	0x09	011	00010001	TAB	41	0x29	051	01010001	)	73	0x49	111	10010001	I	105	0x69	151	11010001	i
10	0x0A	012	00010010	LF	42	0x2A	052	01010010	*	74	0x4A	112	10010010	J	106	0x6A	152	11010010	j
11	0x0B	013	00010011	VT	43	0x2B	053	01010011	+	75	0x4B	113	10010011	K	107	0x6B	153	11010011	k
12	0x0C	014	00011000	FF	44	0x2C	054	01011000	,	76	0x4C	114	10011000	L	108	0x6C	154	11011000	l
13	0x0D	015	00011001	CR	45	0x2D	055	01011001	-	77	0x4D	115	10011001	M	109	0x6D	155	11011001	m
14	0x0E	016	00011010	SO	46	0x2E	056	01011010	.	78	0x4E	116	10011010	N	110	0x6E	156	11011010	n
15	0x0F	017	00011011	SI	47	0x2F	057	01011011	/	79	0x4F	117	10011011	O	111	0x6F	157	11011011	o
16	0x10	020	00100000	DLE	48	0x30	060	01100000	0	80	0x50	120	10100000	P	112	0x70	160	11100000	p
17	0x11	021	00100001	DC1	49	0x31	061	01100001	1	81	0x51	121	10100001	Q	113	0x71	161	11100001	q
18	0x12	022	00100010	DC2	50	0x32	062	01100010	2	82	0x52	122	10100010	R	114	0x72	162	11100010	r
19	0x13	023	00100011	DC3	51	0x33	063	01100011	3	83	0x53	123	10100011	S	115	0x73	163	11100011	s
20	0x14	024	00101000	DC4	52	0x34	064	01101000	4	84	0x54	124	10101000	T	116	0x74	164	11101000	t
21	0x15	025	00101001	NAK	53	0x35	065	01101001	5	85	0x55	125	10101001	U	117	0x75	165	11101001	u
22	0x16	026	00101010	SYN	54	0x36	066	01101010	6	86	0x56	126	10101010	V	118	0x76	166	11101010	v
23	0x17	027	00101011	ETB	55	0x37	067	01101011	7	87	0x57	127	10101011	W	119	0x77	167	11101011	w
24	0x18	030	00110000	CAN	56	0x38	070	01110000	8	88	0x58	130	10110000	X	120	0x78	170	11110000	x
25	0x19	031	00110001	EM	57	0x39	071	01110001	9	89	0x59	131	10110001	Y	121	0x79	171	11110001	y
26	0x1A	032	00110010	SUB	58	0x3A	072	01110010	:	90	0x5A	132	10110010	Z	122	0x7A	172	11110010	z
27	0x1B	033	00110011	ESC	59	0x3B	073	01110011	;	91	0x5B	133	10110011	[	123	0x7B	173	11110011	{
28	0x1C	034	00111000	FS	60	0x3C	074	01111000	<	92	0x5C	134	10111000	\	124	0x7C	174	11111000	
29	0x1D	035	00111001	GS	61	0x3D	075	01111001	=	93	0x5D	135	10111001	]	125	0x7D	175	11111001	}
30	0x1E	036	00111010	RS	62	0x3E	076	01111010	>	94	0x5E	136	10111010	^	126	0x7E	176	11111010	~
31	0x1F	037	00111011	US	63	0x3F	077	01111011	?	95	0x5F	137	10111011	_	127	0x7F	177	11111011	DEL



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Printed in USA
Publication No. APxxxxxx
January 30, 2016

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