# LynTec RS-232 Controlled Retrofit Relay Panels

- Tested, complete package — low labor — mount next to circuit breaker panel to control AC power "hot" lines

- Time proven, reliable, G-E RR7P3 latching relays snap in and have low voltage plug-in connectors

- Low power consumption — no continuous relay coil current — runs cool for long life

- Diagnostic LEDs and internal ON - OFF test switches speed installation for testing and troubleshooting

- Cabinet and all components connected to high voltage are UL listed — Electrician friendly

- 4, 8 or 10 circuits — 120, 240 or 277 volt models available

- Daisy-chains for unlimited circuit count.

- Automatic load shedding and brownout protection.

- Built-in emergency override function

## G-E RR7P3 Latching Relay

## G-E RR7 and RR9 Relay ratings

Power Contacts: Latching
20A Tungsten, 125Vac 1/2HP motor at 110-125Vac
30A Ballast, 277Vac 1 1/2 HP motor at 277Vac
30A Resistive, 277VAC
20A Ballast, 347VAC 1 1/2 HP motor at 220-277VAC
20A Resistive, 347Vac

### FOR COPPER WIRE ONLY

This product is NEC 110 Compliant when used in accordance with the following: Suitable For Use On A Circuit Capable Of Delivering Not More Than 10 kA Sym. Amps., 277 Volts Maximum.
UL Listed 508G Industrial Control Equipment — CSA certified

Low voltage characteristics — RR7P3
P3 suffix denotes a 3 pin, .156" AMP or Molex connector attached. RR9P has a five pin connector.

Actuating coils: 21-30 Vac (class 2) Momentary.  OFF (1-black), ON (2-red), Common (3-Blue) 55-60 Ohms DCR, each coil.

This circuit breaker panel is shown for illustration purposes and is not sold by LynTec.

To avoid nuisance circuit breaker tripping on high inrush current devices, specify **H**igh **M**agnetic circuit breakers.

High Magnetic type breakers typically have the **HM** suffix such as Square D QO120**HM**, Cutler Hammer CH120**HM** or G-E THQL1120**HM**.

24 V — 40 VA Power transformer. Connect to 10A circuit breaker. Mark

## RS-232 CONTROL
## POWER

Numbered circuit LED Indicates status of relay. Flashes during Delayed OFF countdown.

DIVIDING WALL

LOW VOLTAGE SECTION

HIGH VOLTAGE SECTION

15A or 20A circuit breaker "hots" feed RS-232 Controlled Relays

Movable circuit jumpers set the RS-232 board address.INVALID Address example below.

If the relay configuration is changed by adding, deleting or moving relays, update the relay status with a re-scan.

Cycle the RS-232 CONTROL POWER  breaker off for at least 3 seconds or push the reset button to re-scan.

Receiving RS-232 LED Flashes when a valid RS-232 signal is received.

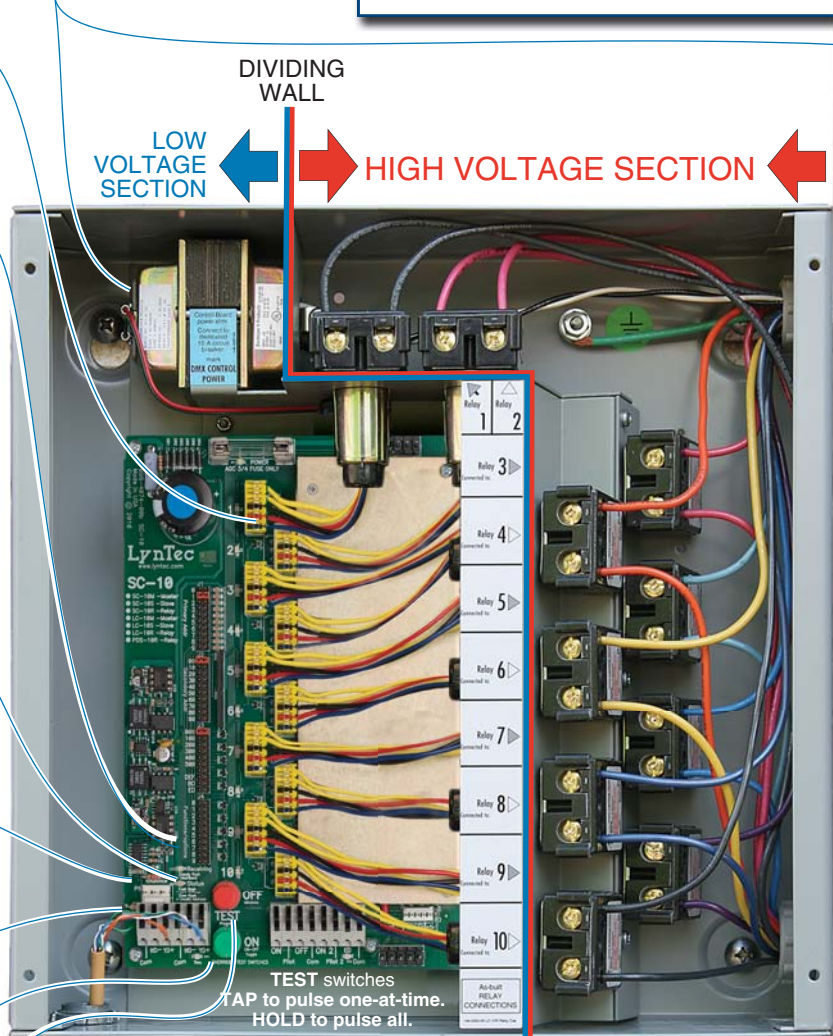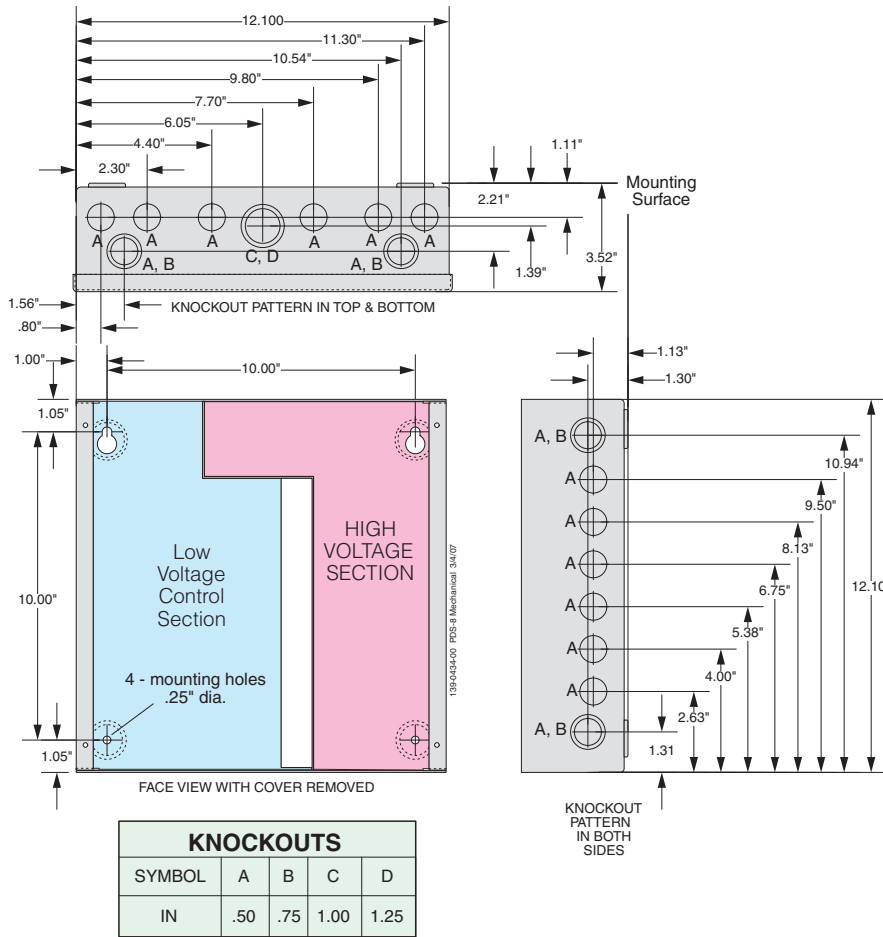MTA .156" RS-232 Input Test plug

RS-232 Input Terminated

Buffered RS-232 Output Flickering LED indicates presence of data.

RS-232 In — RS-232 Out

**TEST** switches **TAP to pulse one-at-time. HOLD to pulse all.**

Test switches provide manual control in the absence of a RS-232 signal. RS-232 OVERRIDES TEST SWITCHES

Warning LED Fast flash = Low line voltage

Slow flash = Invalid Address

Lit Continuously = No relays attached.

RS-232 Controlled "hots" to instruments

**For 208V or 240V RS-232 Control ask about our SC series load center and panelboards or our RPC series networkable panels**

# WIRING AND INTERIOR



## KNOCKOUT PATTERN IN TOP & BOTTOM

Mounting Surface

## FACE VIEW WITH COVER REMOVED

Low Voltage Control Section

HIGH VOLTAGE SECTION

4 - mounting holes .25" dia.

139-0434-00 PDS-8 Mechanical 3/4/07

## KNOCKOUT PATTERN IN BOTH SIDES

| KNOCKOUTS | | | | |
|---|---|---|---|---|
| SYMBOL | A | B | C | D |
| IN | .50 | .75 | 1.00 | 1.25 |

## MODELS

**SCRP-4** Ten circuit RS-232 Relay Controller cabinet with 4 - 20A Relays

**SCRP-8** Ten circuit RS-232 Relay Controller cabinet with 8 - 20A Relays

**SCRP-10** Ten circuit RS-232 Relay Controller cabinet with 10 - 20A Relays

**-277v Option** Add -277 suffix to model number re: SCRP-10-277 (for controller power input only)

**-OV Option** Add -OV suffix for 220-240V, 50-60 HZ operation (for controller power input only)

# Other LynTec Products

LynTec is the leader in motorized breaker systems--providing A/C circuit protection and control in a single panel solution. All three control options are available in full size panel boards and load centers, as well as a modular raintight cabinet for use in modifying existing Square D panels.

Load Centers (LC): MSLC (Sequencing), LCLC (DMX individual circuit control), SCLC (RS-232 individual circuit control). 26 and 41 circuit models available.

Panelboards (P): MSP (Sequencing), LCP (DMX individual circuit control), SCP (RS-232 individual circuit control). Available in 41 circuit models.

RPC series panelboards offer web-based remote control and monitoring with a variety of control options including TCP/IP, DMX, RS-232 and contact closure. 29 and 41 circuit enclosures available.



## www.LynTec.com
### 800-724-4047  913-529-2233

# PRODUCT SPECIFICATIONS

## Circuits controlled by one or more SC-10 Control boards

The SC-10R board has 10 drivers capable of powering one RR7 or RR9 relay.

Each relay has its own individual RS-232 address.

## BOARD address

The **Board address** is field programmed by installing push-on jumpers.

Each board has a starting RS-232 address which is typically set between 1 and 99.

The SC-10 board scans addresses for relays it locates at power-up or during reset. At power-up or during reset, the board scans and pulses all breaker connectors from 1 to 10. Each relay load found is assigned a status. See RS-232 protcol for more detailed descriptions

## NOTE

If a relay is plugged into a connector **after** power-up it will be ignored until a new power-up scan is run by cycling the RS-232 CONTROL POWER breaker off for at least 3 seconds or pushing the red reset button..

## Indicator LEDs

### Amber POWER LED

Power to each SC-10 circuit board is indicated by the amber **POWER** LED.

### Numbered Green LEDs, **1 - 10**

Green numbered LEDs, adjacent to each relay connector, light when the circuit relay has been pulsed on.

### Red warning LED

**Low Voltage**, or *No Relays Attached*

**Low Voltage** = A fast red flash indicates AC line voltage is below 105 VAC - No RS-232 reception or execution.

*No Relays Attached* = A continuously lit red LED indicates no relays were found at the time of the power-up scan.

### Green Receiving RS-232 LED

When the **Receiving RS-232** LED is flashing, the system is active and ready to execute RS-232 commands. The **Receiving RS-232** LED *stays* lit during command execution.

### Green RS-232 Output LED

Flickering LED indicates data presence at the Buffered RS-232 Output.

## Brown-out protection

Five seconds after power stabilizes above 105 volts, the board begins receiving RS-232 signals, as indicated by a flashing green **Receiving RS-232** LED.

When the Receiving RS-232 LED is flashing, the system is ready to execute RS-232 commands. A *fast* flashing red LED indicates the power hasn't been above 105 volts for the last 5 seconds and the controller is waiting for the power to stabilize before resuming RS-232 reception.

## G-E RR7 Relay ratings — see page 2

## G-E Cabinet — Type 1 Enclosure "INDOOR USE ONLY"
UL Listed 508G — Industrial Control Equipment — CSA Certified

## RS-232 CONTROL POWER

A dedicated 10 Amp circuit breaker, marked **RS-232 CONTROL POWER** should be used to feed the 24v, 40 VA transformer or the 50 VA, 277v Option.

This 10 amp breaker should be left on continuously. This circuit breaker is used as an approved, switchable connection method to the high voltage. The 40VA, 120v, **UL** & **UL**$_C$ listed transformer is impedance protected with an internal thermal fuse. The 50 VA, 277v Option transformer has a pushbutton-reset internal breaker.

Each controller board is protected by an on-board 3AG 3/4 amp fuse.

Power required: 50/60 Hz, 6.5 watts with 10 relays in the on condition.
(All indicator LEDs lit)

### MODELS

**SCRP-4 ..** Ten circuit RS-232 Relay Controller cabinet with 4 - 20A Relays

**SCRP-8 ...** Ten circuit RS-232 Relay Controller cabinet with 8 - 20A Relays

**SCRP-10 .** Ten circuit RS-232 Relay Controller cabinet with 10 - 20A Relays

**-277v Option...** Add **-277** suffix to model number re: **SCRP-10-277**

**-OV Option......** Add **-OV** suffix to model number re: **SCRP-10-OV**

# SC-10 RS232 PROTOCOL

## Commands set

| Command | Decimal | Hexadecimal |
|---|---|---|
| Start byte | 176 | 0xB0 |
| Stop byte | 240 | 0xF0 |
| Board address | 1 - 99 | 0x01 – 0x63 |
| Output address | 1 - 10 | 0x01 – 0x0A |
| Output ON | 180 | 0xB4 |
| Output OFF | 181 | 0xB5 |
| Output status | 182 | 0xB6 |
| Status of all outputs | 189 | 0xBD |
| All ON | 186 | 0xBA |
| All OFF | 187 | 0xBB |

## 2.  Commands description

### 2.1  Outputs ON command

**0xB0, board_address, 0xB4, output_address_1, …, output_address_m, 0xF0**

**m<=10 (0x0A)**

Example:  B0 01 B4 04 0A F0, turns on outputs at 4 and 10, on 1st card

### 2.2  Outputs OFF command

**0xB0, board_address, 0xB5, output_address_1, …, output_address_n, 0xF0**

**n<=10 (0x0A)**

Example:  B0 02 B5 09 F0, turns off output at 9, on 2nd card

### 2.3  Outputs ON/OFF command

**0xB0, board_address, 0xB4, output_address_1, …, output_address_m, 0xB5, output_address_1, …, output_address_n, 0xF0**

m and n<=10 (0x0A)

Example:  B0 01 B4 04 0A B5 09 F0, turns on output at 4 and 10, and turns off output at 9, on 1st card

### 2.4  Outputs status

**0xB0, board_address, 0xB6, output_address_1, …, output_address_m, 0xF0**

**m<=10 (0x0A)**

Example:  B0 03 B6 04 0A F0, status of outputs at 4 and 10, on 3rd card

### 2.5  Status of all outputs

**0xB0, board_address, 0xBD, 0xF0**

### 2.6  All ON - turn on all available outputs

**0xB0, board_address, 0xBA, 0xF0**

### 2.7  All OFF - turn off all available outputs

**0xB0, board_address, 0xBB, 0xF0**

2.8 Set/clear output verification status (NOT IMPLEMENTED)

**0xB0, board_address, 0xBE, output_address_i, output_ver_status_i, output_address_j, output_ver_status_j, ..., output_address_n, output_ver_status_n, 0xF0**

output_address_i, output_ver_status_i, output_address_j, output_ver_status_j, ..., output_address_n, output_ver_status_n – addresses and status of outputs, n<=10

Output_ver_status coding

| Status | Code |
|--------|------|
| Disable | 0x01 |
| Enable | 0x02 |

When verification status of the output is disabled, the board will always respond with "no verification" status for this output. Verification status shall be disabled for all outputs driving RR7 relays.

## 3.  Responses

3.1  Output status codes

| Status | Code |
|--------|------|
| Off | 0x01 |
| On | 0x02 |
| Fault | 0x03 |
| No verification, expected off | 0x04 |
| No verification, expected on | 0x05 |
| Empty | 0x06 |

3.2  Output status change response

This response is transmitted when output(s) change(s) status for ANY reason (RS232 command, button push, brown out, recover from brown out, emergency override, recover from emergency override).

**0xB0, board_address, 0xB6, output_address_i, output_status_i, ..., output_address_n, output_status_n, 0xF0**

n<=10 (0x0A)

Example:  B0 01 B6 04 01 05 02 0A 06 F0, output at 4 is off, at 5 is on, and at 10 is empty, on 1st card

3.3  Status of all ten outputs (transmitted only in reply to status of all outputs command)

**0xB0, board_address, 0xBD, byte_1, ..., byte_10, 0xF0**

Example:  B0 02 BD 01 01 01 01 01 02 02 02 02 06 F0, outputs 1 thru 5 are off, 6 thru 9 are on, and 10 is empty, on 2nd card

## 4.  AMX Device Discovery

Beacon request: **"AMX\r"**

Beacon: "AMXB<-SDKClass=Utility><-Make=Lyntec><-Model=SC10><-Revision=1.0.0>\r"