LynTec RS-232 Controlled Panels and Load Centers

Motorized Breakers Make Control Easy!

All relay-based systems **MUST** be electrically protected by a circuit breaker. Motorized breakers eliminate the need for wall or rack mounted relay-based systems...

- ❒ Saves Space
- ❒ Saves redundant installation and hardware costs!
- ❒ UL listed circuit breaker with built-in internal switching capability manufactured by SQUARE D
- ❒ Time tested, in service over 20 years
- ❒ Available in 15A, 20A and 30A - 1, 2 or 3 poles for remote control of all electrical loads
- ❒ Robust - rated for 60k on, off, on cycles
- ❒ Energy efficient - NO holding current or heat sinks required to maintain state - Runs cool, lasts long!
- ❒ Automatic load shedding and brownout protection in every panel.
- ❒ Emergency override funtion standard on every panel.

Specifiying in 5 easy steps

1. Choose the control method: **SC**=RS-232
2. Choose the cabinet style: **LC** for load center and **P** for panelboard
3. Choose three phase (**3**) or single phase (**1**)
4. Choose the number of circuits: **26** or **41** Panelboards are only available in 41 circuits.
5. Choose the maximum number of controlled circuits: **10,20, 30, 40,** or **50.**

EX: **SCLC 326-20** = a 3 phase load center with 26 circuits (20 max controlled)
SCP 341-30 = a 3 phase panel board with 41 circuits (30 max controlled)

All panels and load centers

AVAILABLE MODELS

See www.LynTec.com for model specific design and submittal PDFs

LOAD CENTERS

SCLC 326-xx-Mxxx RS-232 Controlled **L**oad **C**enter

3Ø, 208Y/120 Vac, 4 wire. — 100 Amp Main Breaker Standard

LynTec

RS-232 Controlled **L**oad **C**enter

MODEL NUMBERS

SCLC 326-10-Mxxx
(Up to 10 RS-232 controlled circuits)

SCLC 326-20-Mxxx
(Up to 20 RS-232 controlled circuits)

SCLC 326-30-Mxxx
(Up to 26 RS-232 controlled circuits)

Square D QO327M100 Load Center with LynTec low-voltage sidecar.

Standard back-fed Main Breaker:
Squared D# QO3**100**VH. **100**A,
(VH = 22k AIR)
[Amps Interrupt Rating]

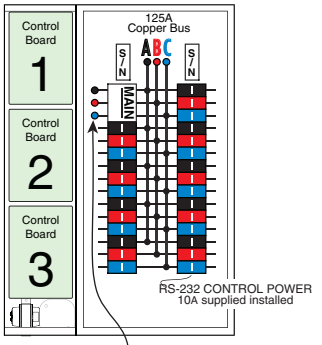
Back-fed Main Breaker options
Part# suffix — **Bold face**=Amps
-M30**30**, -M30**40**: (10kAIR)
Square D# QO30**xx**

-M30**50**, -M30**60,** -M30**70** or -M30**90**
Squared D# QO3**xx**VH
(all VH = 22k AIR)

Wire Sizes
#4 - 2/0 Cu

Outside dimensions
20.9" w., 29.8" h., 3.9" d.

Cabinet Outline — Surface mount only



Main **L**ug **O**nly **-MLO** option
Remove Back fed main and top feed as a MLO to gain 3 circuits. Feed from a protected disconnect.

Provides access to branch breaker positions 1, 3, & 5.

Model number becomes a

SCLC 329-10-MLO
(10 RS-232 controlled circuits)

SCLC 329-20-MLO
(20 RS-232 controlled circuits)

SCLC 329-30-MLO
(Up to 29 RS-232 controlled circuits)

(Holds up to 29 one pole breakers)

125 Amp. Panel Bus Rating
Wire size: #6 - 2/0 Cu

SCLC 341-xx-Mxxx RS-232 Controlled **L**oad **C**enter

3Ø, 208Y/120 Vac, 4 wire. — 225 Amp Main Breaker Standard

LynTec

RS-232 Controlled **L**oad **C**enter

MODEL NUMBERS

SCLC 341-10-Mxxx
(Up to 10 RS-232 controlled circuits)

SCLC 341-20-Mxxx
(Up to 20 RS-232 controlled circuits)

SCLC 341-30-Mxxx
(Up to 30 RS-232 controlled circuits)

SCLC 341-40-Mxxx
(Up to 40 RS-232 controlled circuits)

Square D QO342MQ225 Load Center with LynTec low-voltage sidecar.

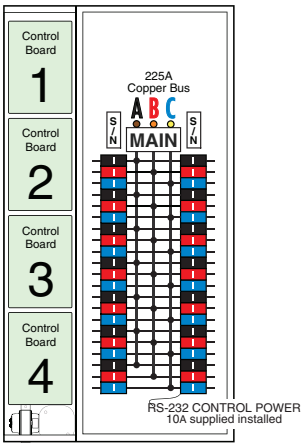
Standard Main Breaker:
Square D# QDL32**225**. **225** Amp

Main Breaker options
Part# suffix — **Bold face**=Amps
-M3**150** or -M3**200**
Square D# QDL32**xxx** series
(all 25k AIR) [Amps Interrupt Rating]

Wire Sizes
Main Breaker :
350 kcmil Al or 250 kcmil Cu.
100% Neutral has one feed lug
1- 350 kcmil Al or 1- 250 kcmil Cu

Outside dimensions
20.9" w., 39.3" h., 3.9" d

Cabinet Outline — Surface mount only



All SQUARE D Panels

PANELBOARDS

SCP 341-xx-Mxxx RS-232 Controlled **P**anelboard

3Ø, 208Y/120 Vac, 4 wire. — 225 Amp Main Breaker Standard

LynTec

RS-232 Controlled **P**anelboard

MODEL NUMBERS

SCP 341-10-Mxxx
(Up to 10 RS-232 controlled circuits)

SCP 341-20-Mxxx
(Up to 20 RS-232 controlled circuits)

SCP 341-30-Mxxx
(Up to 30 RS-232 controlled circuits)

SCP 341-40-Mxxx
(Up to 40 RS-232 controlled circuits)

SCP 341-50-Mxxx
(Up to 41 RS-232 controlled circuits - limited by 42 circuit code rule)

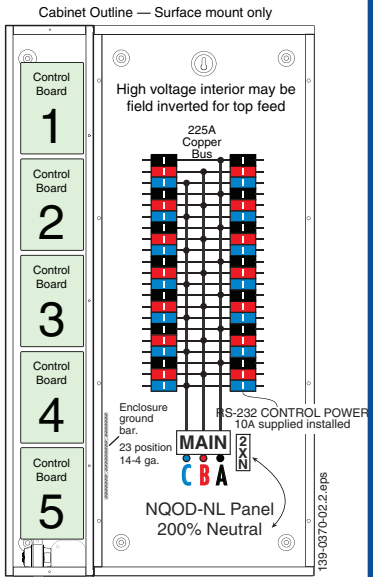
Square D NQOD-NL MB Panel with LynTec low-voltage sidecar.

Standard SCP-**225A** Main Breaker:
225 Amp. - 65k AIR - MJG36**225**

Main Breaker options
Part# suffix — **Bold face** = Amps
-MHG3**125**, -MJG3**150**, -MJG3**175** or -MJG3**200**

Wire Sizes
Main Breaker: 3/0 - 350 kcmil Al/Cu
200% Neutral has one feed lug that accepts 2 - 250 kcmil Cu wires

Cabinet Outline — Surface mount only



Outside dimensions
28.06" w., 50" h., 6.13" d.

Knockout panels supplied in both ends

Optional isolated technical ground sidecar not shown

SCP 341-xx-M400 RS-232 Controlled **P**anelboard

3Ø, 208Y/120 Vac, 4 wire. — 400 Amp Main Breaker Standard

LynTec

RS-232 Controlled **P**anelboard

MODEL NUMBERS

SCP 341-10-M400
(Up to 10 RS-232 controlled circuits)

SCP 341-20-M400
(Up to 20 RS-232 controlled circuits)

SCP 341-30-M400
(Up to 30 RS-232 controlled circuits)

SCP 341-40-M400
(Up to 40 RS-232 controlled circuits)

SCP 341-50-M400
(Up to 41 RS-232 controlled circuits - limited by 42 circuit code rule)

Square D NQOD MB Panel with LynTec low-voltage sidecar.

Standard **SCP 400A** Main Breaker:
400 Amp. - 10k AIR - LA36400
[Amps Interrupt Rating]

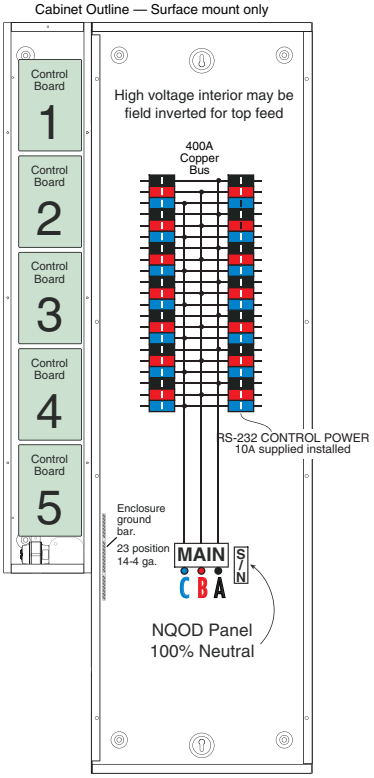
Wire Sizes
Main Breaker: 1 #1- 600 kcmil Cu or 2 - #1-250 kcmil Cu (per NEC)

100% Neutral has one feed lug that accepts one #1-750 kcmil or two #1-300 kcmil Cu wires.

Outside dimensions:
28.06" w., 68.2" h., 6.13" d.

Optional isolated technical ground

Cabinet Outline — Surface mount only



Planning and Layout Worksheet — As-built door label
LynTec SCLC 326-xx RS-232 Controlled Load Center
Breaker types, sizes, positions and connections

Job_____

Panel _____

Comments_____

_____

by_____ Date_____

Each motorized breaker is actuated by a command from a RS-232 control device.
As-built door label example:
The RS-232 # _____ is the RS-232 address of this breaker.
The board jumpers set the RS-232 address of the board. Each breaker has a sub-address of 1-10
Bold line around box ☐ = ***suggested*** control board: #1 (Top), #2, #3 or #4.
Fill in ■ box to indicate which control board this breaker is connected to.

SC-10 circuit boards in left-hand, low-voltage cabinet.

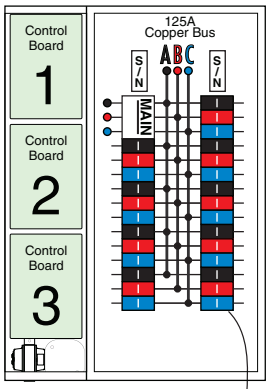
Transfer as-built information to the door.

Keep this sheet for as-built documentation.

Available as PDF download
www.lyntec.com/139-0537_SCLC326_Plnr.pdf

LynTec
RS-232 Controlled
Load Center
SCLC 326-xx
-xx = Maximum number of controlled breakers.
See right side of page for model number for explanation.

Cabinet Outline — Surface mount only



Square D QO327M100 Load Center with LynTec low-voltage sidecar

Standard back-fed Main Breaker QO3**100VH**. **100**A, [VH = 22kAIR].
Main options — Part# suffix

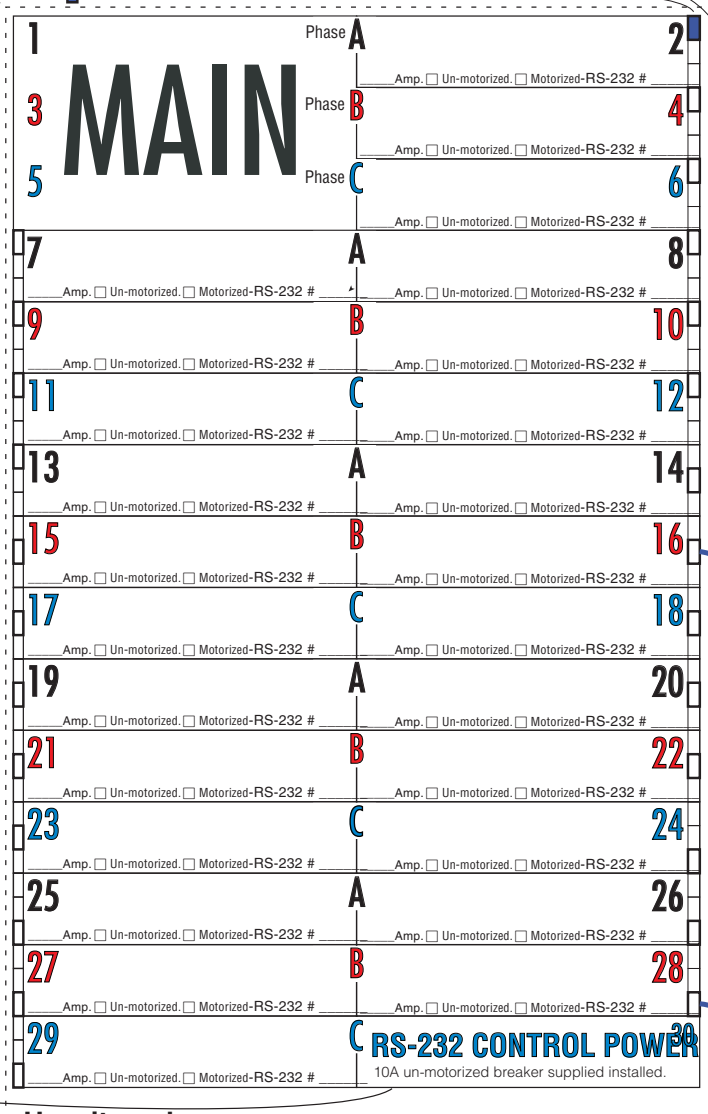
BOLD FACE = Amps

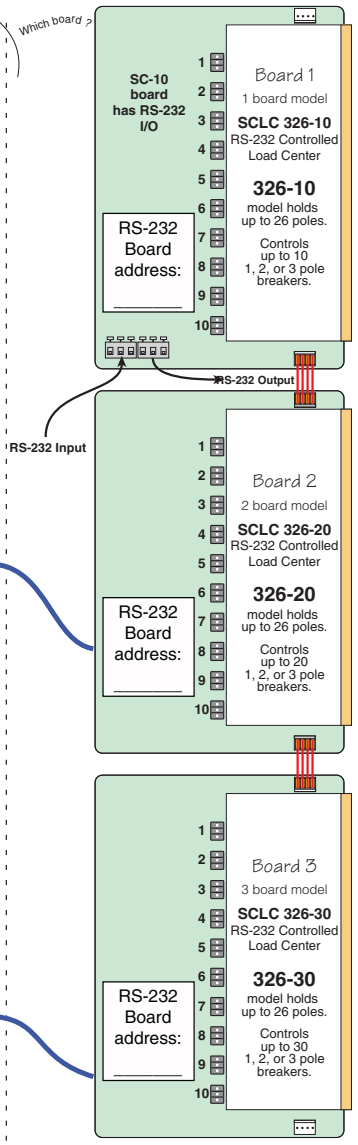
-M30**30**, -M30**35**
QO3**xx** [all 10kAIR]

-M30**50**, -M30**60**, -30**70**, or -M30**90**
QO3**xx**VH [all 22kAIR]
[Amps Interrrupt Rating

Wire: #4 - 2/0 kcmil Cu

Outside Dimensions
20.9" w., 29.8" h., 3.9" d.
Surface mount only.





How it works

The **CONTROL POWER** circuit breaker powers the circuit boards via a 24 volt transformer.

Motorized circuit breakers (face-marked **REMOTELY OPERATED**) are individually actuated by a command from a remote RS-232 control device.

Each numbered LED idicates the status of that addressed breaker.
Lit = ON, Unlit = OFF
Flashing = command execution in progress.

Each circuit board controls up to ten 1, 2 or 3 pole motorized circuit breakers.

RS-232 signals are fed to the first board of each RS-232 panel.

Power and RS-232 data are daisy-chain fed board to board by the yellow jumper connectors.

The RS-232 address is set for each board by jumpers.

The RS-232 output is an optoisolated, buffered, loop-thru for driving other RS-232 devices. Output data availability is indicated by a flicering LED

MANUAL CONTROL

The circuit breakers may be manually controlled by the TEST switches on each board.

The test switches work in the absence of a RS-232 signal. A valid RS-232 signal, indicated by a flashing **Receiving** RS-232 LED overrides the test switches.

www.LynTec.com
800-724-4047
8-5 Central Time

Document # 139-0537-00 SCLC 326 Planner 3/17/10

SC-10 RS-232 CONTROLLER BOARDS

Numbered circuit LED
Indicates status of breaker.
Flashes during timed
command countdown.

Movable circuit jumpers set the RS-232 **BOARD address**. The SC-10 board scans addresses for breakers 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 breaker load found is assigned a status. If the breaker configuration is changed by adding, deleting or moving breakers, update the breaker status with a re-scan.

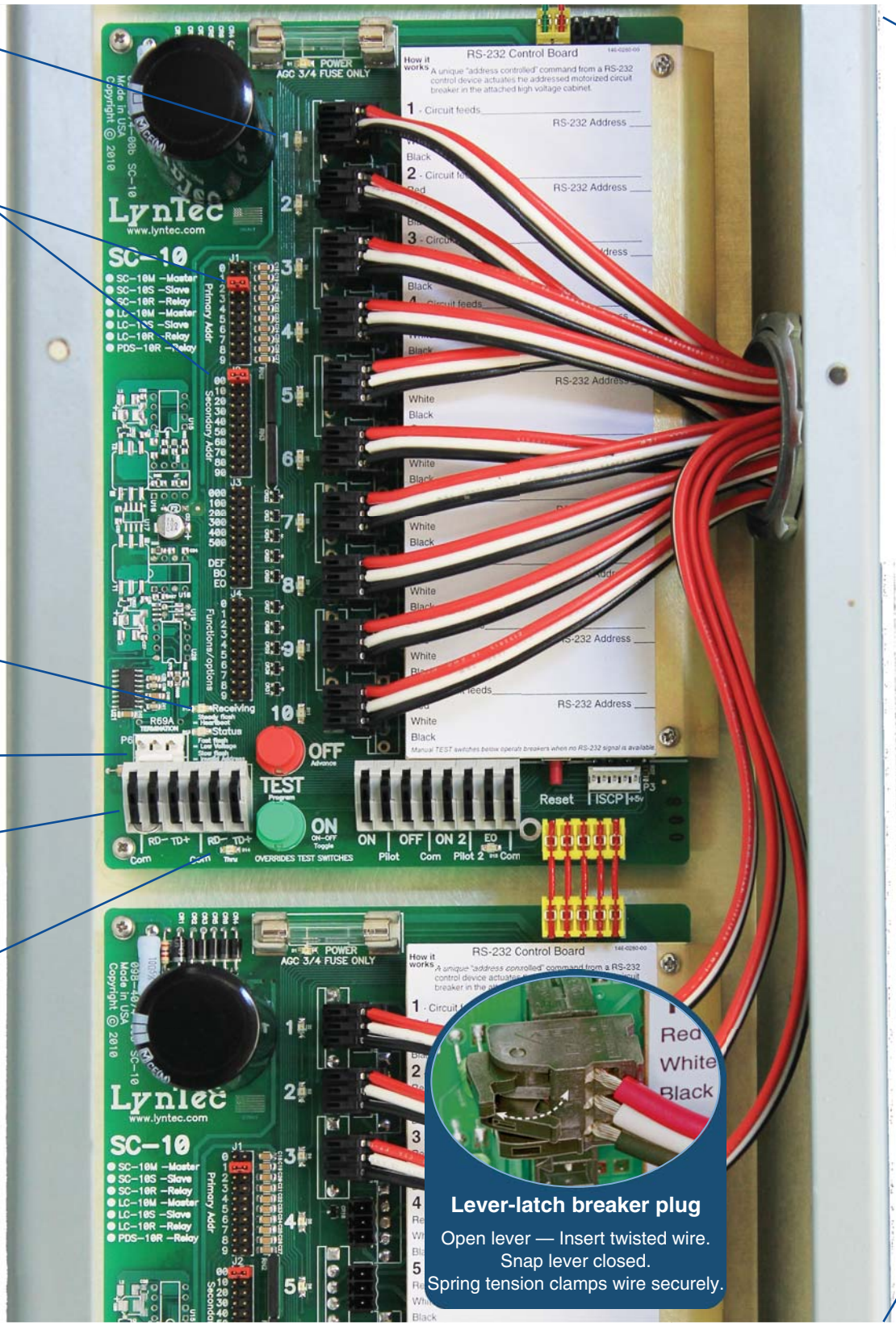
Cycle the **RS-232 CONTROL POWER** breaker off for at least 3 sec. or press the reset button to re-scan.

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

MTA .156"
RS-232 Input
Test plug

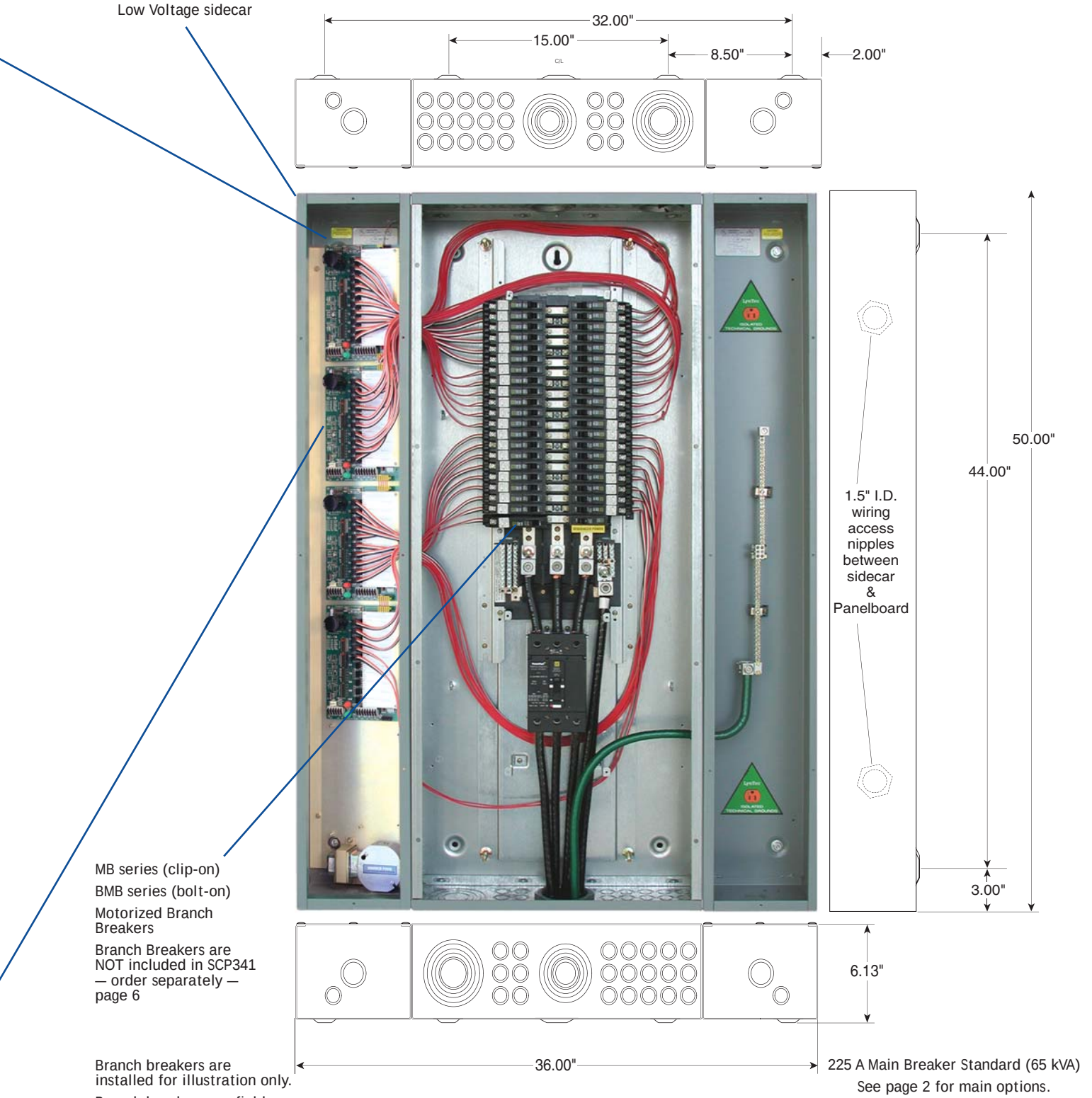
Input Terminals

Buffered RS-232 Output
Flickering LED indicates
data presence.



RS-232 CONTROLLED PANELBOARDS

Model shown
SCP 341-40
RS-232 Controled **P**anelboard with optional ITG cabinet



MB series (clip-on)

BMB series (bolt-on)

Motorized Branch Breakers

Branch Breakers are NOT included in SCP341 — order separately — page 6

Branch breakers are installed for illustration only.

Branch breakers are field installed and low-voltage wired to appropriate sequencer boards in left sidecar per sound system requirements.

See typical Panel Planner on page 3

225 A Main Breaker Standard (65 kVA)

See page 2 for main options.

Interior factory installed for bottom feed.

May be field reversed for top feed.

Reverse interior, then reverse the main breaker and main breaker bracket position to maintain a "up-is-on" main breaker handle.

139-0536-01.5

MOTORIZED BREAKERS

Handle functions as a normal circuit breaker.

When switched off or tripped due to overload, the remote control will not turn on power.

When in the normal ON position, the motorized remote control will turn it off and on.

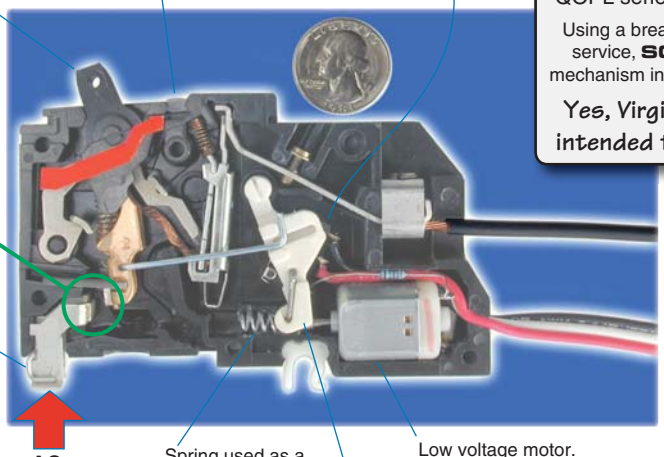
The motor does not move the handle... it only opens or closes the high current contacts.

Snap on clip with heavy steel force spring.

Contact is held tightly in place on panel bus feeder finger.

Under high current stress, magnetic forces actually increase contact pressure.

Also available in Bolt-on versions for Panelboards only.



The time-proven **SQUARE D** QOPL series motorized circuit breaker.

Using a breaker proven in over 20 years of service, **SQUARE D** added a motor mechanism in 1986 to provide remote control.

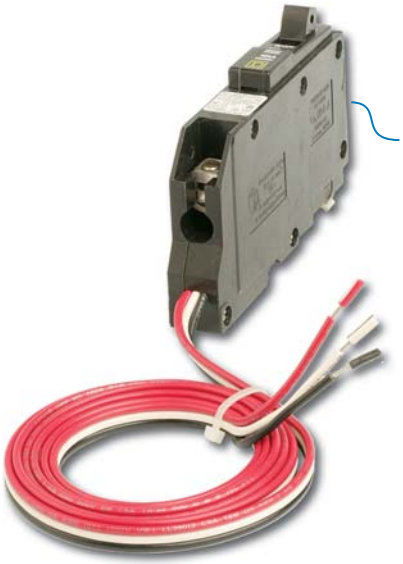
Yes, Virginia, some breakers are intended to be used as switches!

3 wire, low-voltage, 60" pigtail with 600 volt insulation.

Connects to Controller in low voltage cabinet.

Field installed, UL & CSA listed, motorized circuit breakers are required to complete the panel package.

BLUE TYPE = **Bolt-on breakers for Panelboards ONLY — Clip-on breakers fit Load Centers or Panelboards**



BMB-15 ..... **B**olt-on **M**otorized **B**reaker, Square D #QOB115PL-5393
MB-15 ..... Clip-on **M**otorized **B**reaker, Square D #QO115PL-5393
One pole, 15 Amps. Special 60" leads. Square D trip curve: 730-4

BMB-20 ..... **B**olt-on **M**otorized **B**reaker, Square D #QOB120PL-5393
MB-20 ..... Clip-on **M**otorized **B**reaker, Square D #QO120PL-5393
One pole, 20 Amps. Special 60" leads. Square D trip curve: 730-4
15 and 20 Amp breakers have a HM, (High Magnetic) rating.
HM reduces nuisance breaker trips on high inrush loads.

BMB-220 ..... **B**olt-on **M**otorized **B**reaker, Square D #QOB220PL-5393
MB-220 ..... Clip-on **M**otorized **B**reaker, Square D #QO220PL-5393
Two pole, 20 Amps. Special 60" leads. Square D trip curve: 730-4
15 and 20 Amp breakers have a HM, (High Magnetic) rating.
HM reduces nuisance breaker trips on high inrush loads.

BMB-30 ..... **B**olt-on **M**otorized **B**reaker, Square D #QOB130PL-5393
MB-30 ..... Clip-on **M**otorized **B**reaker, Square D #QO130PL-5393
One pole, 30 Amps. Special 60" leads. Square D trip curve: 730-5

BMB-230 ..... **B**olt-on **M**otorized **B**reaker, Square D #QOB230PL-5393
MB-230 ..... Clip-on **M**otorized **B**reaker, Square D #QO230PL-5393
Two pole, 30 Amps. Special 60" leads. Square D trip curve: 730-5

2 pole **30**A, **40**A and **60**A and 3 pole Bolt-on and Clip-on Motorized Breakers are also available on special order. — Call 800-724-4047 for price and delivery.

UnMotorized circuit breakers for un-controlled circuits

BUMB-10, **-15**, **-20** or **-30** are Bolt-on, 10, 15, 20 or 30 amp single pole.
Square D QOB110, QOB115HM, QOB120HM or QOB130. — 15s & 20s are High Magnetic.

UMB-10, **-15**, **-20** or **-30** are Clip-on, 10, 15, 20 or 30 amp single pole.
Square D QO110, QO115HM, QO120HM or QO130. — 15s & 20s are High Magnetic.

PRODUCT SPECIFICATIONS

Circuits controlled by one or more SC-10 Control boards

Each SC-10 board has 10 drivers capable of driving one 1, 2 or 3 pole BMB or **MB** series motorized circuit breakers. Each breaker has its own individual RS-232 sub- address. The motorized breakers may be located in any open slot in the panel.
Bold face type = legends printed on SC-10 boards.

STARTING 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 breakers 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 breaker load found is assigned a status. See RS-232 protcol for more detailed descriptions

NOTE

If a breaker is plugged into a connector ***after*** power-up it will be ignored until a new power-up scan/reset 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 breaker connector, light when the circuit breaker motor has been pulsed on.

Red warning LED **Low Voltage**, **INVALID address** or **No Breakers Attached**

Low Voltage = A fast red flash indicates AC line voltage is below 105 VAC - No RS-232 reception or execution.
INVALID address = A slow (1 Hz) red flash indicates an invalid address setting recieved per individual card.

No Breakers Attached = A continuously lit red LED indicates no breakers 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 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.

Motorized Circuit Breaker Low Voltage Connections

Each motorized breaker derives its control power through a 60" - 3 conductor wire. This low voltage, 600 volt insulated, cable is field connected to the lever-latch 3 pin plugs. The lever-latch plugs fit into numbered receptacles on the circuit board/s.

RS-232 CONTROL POWER

The RS-232 CONTROL POWER circuit breaker, mounted in the lower right position in the high voltage section of the panel, is connected to a UL listed 120v to 24v, 40 VA transformer mounted inside the low voltage cabinet.
This 10 amp un-motorized breaker should be left on continuously. This circuit breaker is used as an approved, switchable connection method to the high voltage. The **UL** & **UL$_c$** listed transformer is impedance protected with an internal thermal fuse.
Each sequencer board is protected by an on-board 3AG 3/4 amp fuse.
Power required: 50/60 Hz, 6.5 watts per board with 10 breakers in the on condition. 33 watts maximum per panel.

ARCHITECTS & ENGINEERS SPECIFICATIONS
for PDF and Word file links
see **http://www.lyntec.com/139-0578_SCLC_A&E_Spec.pdf**
and
http://www.lyntec.com/139-0578_SCP_A&E_Spec.pdf

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

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
EO/BO Active Response	203	0xCB

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
Emergency Override or Brownout Shutdown (EO or BO)	0xCB

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"