

All sound systems need a power panel - why not have ONE TOUCH AC power control?
Motorized circuit breakers sequence sound system AC power!

MSP 341-xx Modular Sequencing Panelboard - The Electrician's choice



LynTec Modular Sequencing series panels add branch circuit sequencing to the main and branch circuit breaker functions normally found in a Load Center or Panelboard.

How they work

Applies AC to low level, front-end electronics... waits for them to stabilize... (clicks and pops are ignored by un-powered power amplifiers)...

AC is then sequenced to power amplifiers to spread high inrush currents over time.

Protects valuable loudspeaker systems by delaying turn-on until all low level equipment has stabilized.

ONE TOUCH REMOTE POWER CONTROL

SHOWN ACTUAL SIZE



Green LED illuminated

Red

SS-2 Sequencer Switch Set

One SS-2 switch set is supplied with each panel.

LynTec Modular Sequencing series Power Panels


BENEFITS


- ✓ **ONE TOUCH remote power control**
 - Immediate visual feedback provided by flashing **ON** switch.
 - Light stays **ON** to verify sequence completion.
 - Process is reversed for turn-off sequence.
 - May be controlled from one to six locations.
 - Multiple sequencing panels may be daisy-chained for larger systems.
- ✓ **Reduced installation labor**
 - One wall-mounted, sequenced power panel feeds AC power to all rack and console receptacles.
- ✓ **Low power consumption**
 - **BMB** (Bolt-on) and **MB** (Clip-on) series motorized circuit breakers require no holding current (like DC relays) or heat sinks (like solid state relays).
 - *Runs cool — lasts long.*
- ✓ **Automatic load shedding and *BROWNOUT* protection**
 - A voltage sensing system automatically sheds the load when AC mains voltage drops below 95 volts for 2 seconds.
 - Capacitor-stored energy zips-off all circuits 2 seconds after power fails.
 - The system automatically re-sequences without operator intervention when stable voltage (above 105 volts for 5 seconds) resumes.
 - Reduces the start-up load for auxiliary power units.
 - *Smart wake-up is ideal for unattended systems.*
- ✓ **Kill**
 - Emergency instant shutdown may be triggered by an external contact closure.
 - System automatically re-sequences when contact opens.
- ✓ **HurryOff — *Ohh..... no..... switch* – Kill without restart**
 - By holding **any** OFF switch down for 2 seconds, the operator can trigger an instant shutdown with no automatic restart.

LynTec — AVAILABLE MODELS — LynTec

Panel electrical specifications and configurations — Outline dimensions

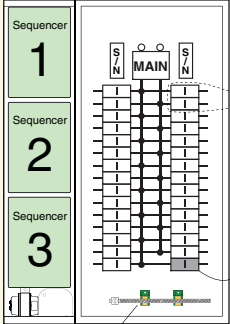
The base model -xx suffix is the number of motorized breakers the control system will drive: -12, -24, -36, -48 or -60.

Click on  icon to download model specific Panel Planners for submittals. —

 Full AllPanel brochure.

MSLC 129-xx
Modular Sequencing Load Center
1Ø, 3 wire, 120/240 Vac.
200 Amp Main Breaker Standard

Cabinet Outline — Surface mount only



SINGLE PHASE

These two positions used for back fed main breaker in **MSLC 127-xx**. (For main breakers 100 Amps or less.)

SEQUENCER POWER 10A supplied installed

Isolated Technical Ground Bar
Feed: 2/0 max. Branches: 29 positions, 14 - 4 ga.

Square D QO130M200 Load Center with LynTec low-voltage sidecar.

Standard Main Breaker: QOM2200VH.

200A, 22k AIR. [Amps Interrupt Rating]
Main Breaker option — Part# suffix
-M1150 Amp

Square D#: QOM2xxxVH, All 22k AIR.
Wire: #4 - 350 kcmil Al/Cu.

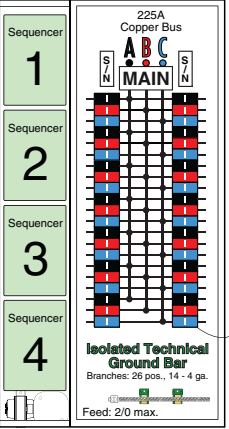
Other back-fed main options
Uses positions 2 & 4 for back-fed main breaker resulting in a **MSLC 127-xx-Mxxx** part #.

Main Options — Part# suffix — **Bold face**=Amps
-M1030, -M1040, -M1060, -M1080 & -M1100 available.

Square D QO2xxxVH, all 22k AIR.
Wire: #4 - 2/0 kcmil Cu.
Outside dimensions
20.9" w., 29.8" h., 3.9" d.

MSLC 341-xx
Modular Sequencing Load Center
3Ø, 208Y/120 Vac, 4 wire.
225 Amp Main Breaker Standard

Cabinet Outline — Surface mount only



All SQUARE D Panels

SEQUENCER POWER 10A supplied installed

Isolated Technical Ground Bar
Branches: 26 pos., 14 - 4 ga.
Feed: 2/0 max.

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

Standard Main Breaker: QDL32225. **225 Amp**

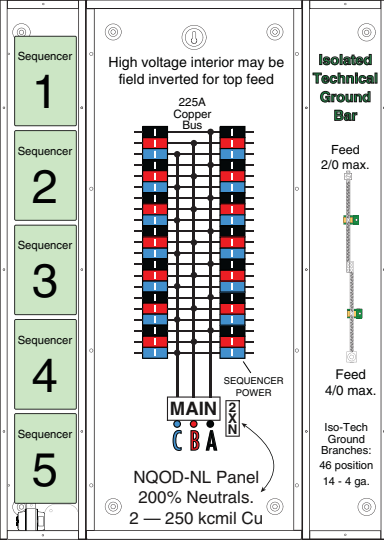
Main Breaker options — Part# suffix — **Bold face**=Amps
-M3150 or -M3200

QDL32xxx series (all 25k AIR) [Amps Interrupt Rating]
Wire: 350 kcmil Al or 250 kcmil Cu. 100% Neutral has one feed lug that accepts one 350 kcmil Al or one 250 kcmil Cu wire.

Outside dimensions
MSLC 341 or MSLC 338
20.9" w., 39.3" h., 3.9" d.

MSP 341-xx
Modular Sequencing Panelboard
3Ø, 208Y/120 Vac, 4 wire.
225 Amp Main Breaker Standard

Cabinet Outline — Surface mount only



High voltage interior may be field inverted for top feed

Isolated Technical Ground Bar
Feed 2/0 max.
Feed 4/0 max.
Iso-Tech Ground Branches: 46 position 14 - 4 ga.

SEQUENCER POWER 10A supplied installed

Isolated Technical Ground Bar
Branches: 26 pos., 14 - 4 ga.
Feed: 2/0 max.

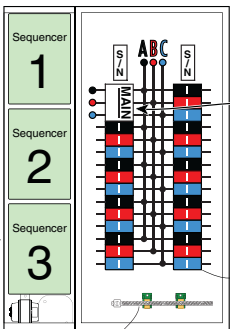
Square D NQOD-NL Panel with LynTec sidecars.
Standard Main Breaker: JGP36225YL — **225 Amp**

Main Breaker options — Part# suffix — **Bold face** = Amps
-MHG3125, -MJG3150, -MJG3175 or -MJG3200
HGP36xxx or JGP36xxx series (all 65k AIR) [Amps Interrupt Rating]

All Panelboards — Outside dimensions — 36" w., 50" h., 6.13" d.
High voltage interior may be field inverted for top feed.
Knockout panels supplied in both ends.

MSLC 326-xx
Modular Sequencing Load Center
3Ø, 208Y/120 Vac, 4 wire.
100 Amp Main Breaker Standard

Cabinet Outline — Surface mount only



MLO option
Back fed main may be replaced by a protected disconnect, allowing up to 29 breakers.
Model no. becomes a **MSLC-329-xx-MLO**

SEQUENCER POWER 10A supplied installed

Isolated Technical Ground Bar
Feed: 2/0 max. Branches: 26 positions, 14 - 4 ga.

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

Standard back-fed Main Breaker:
Squared D#: QO3100VH. **100A**, (VH = 22k AIR) [Amps Interrupt Rating].

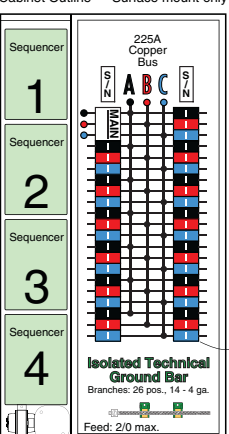
Main Breaker options —

Main Lug Only -MLO option
Feed this panel with appropriate protected disconnect.
Panel Mains Rating is 200A.
Provides access to branch breaker positions 1, 3, & 5.
Becomes **MSLC 329-xx-MLO** (may hold up to 29 breakers)

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

MSLC 338-xx
Modular Sequencing Load Center
3Ø, 208Y/120 Vac, 4 wire.
30 to 100 Amp back-fed Main Breaker

Cabinet Outline — Surface mount only



SEQUENCER POWER 10A supplied installed

Isolated Technical Ground Bar
Branches: 26 pos., 14 - 4 ga.
Feed: 2/0 max.

Square D QO342 Load Center with LynTec low-voltage sidecar.

back-fed Main Breaker options
Part# suffix — **Bold face**=Amps
-M3030, -M3035: (10kAIR)
Squared D#: QO30xx

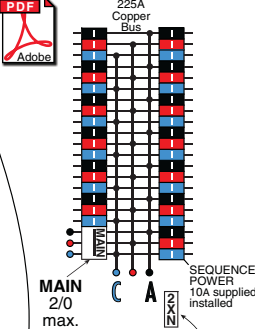
-M3050, -M3060, -M3070 or -M3090
Squared D#: QO3xxVH (all 22k AIR) [Amps Interrupt Rating]
Wire: #4 - 2/0 kcmil Cu.

Neutral data and Outline Dimensions same as MSLC 341 above.

Panelboard INTERIOR Alternatives

Cabinet outlines same as 3 phase above

MSP 338-xx
Modular Sequencing Panelboard
3Ø, 208Y/120 Vac, 4 wire.
30 to 100 Amp QOB3xx series
Bolt-on, back-fed Main Breaker

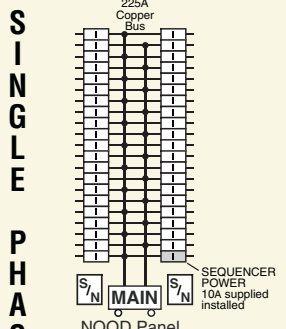


SEQUENCER POWER 10A supplied installed

NQOD-NL Panel
225A Copper Bus
200% Neutrals.
2 — 250 kcmil Cu

MSP 141-xx
Modular Sequencing Panelboard
1Ø, 3 wire, 120/240 Vac.
All Special Order, **NCNR.**
(Non Cancelable, Non Returnable)

SINGLE PHASE



SEQUENCER POWER 10A supplied installed

NQOD Panel
225A Copper Bus
#4 — 300 kcmil Al/Cu

Main Breakers available
QDL22xxx series — All 25k AIR
Part# suffix — **Bold face** = Amps
-MQD2070, -MQD2080, -MQD2090,
-MQD2100, -MQD2110, -MQD2125,
-MQD2150, -MQD2175, -MQD2100,
-MQD2200, -MQD2225.

Typical Panel Planner and Layout Worksheet — As-built door label

See  at LynTec.com for *model specific* Panel Planners for submittals

Planning and Layout Worksheet — As-built door label
LynTec MSLC 326-xx Modular Sequencing Load Center
 (One-Touch, sequential AC power control for Sound & AV Systems)

Breaker types, sizes, positions and connections

Job _____
 Panel _____
 Comments _____

 by _____ Date _____

Transfer as-built information to the door label upon completion.

Keep this sheet for as-built documentation

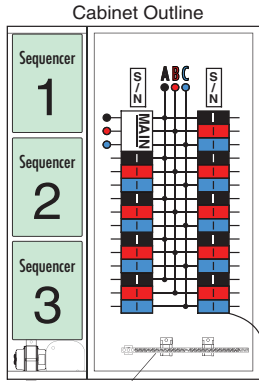
Available as PDF download
www.lyntec.com/139-0245_MSLC326Plnr.pdf

LynTec MSLC 326-xx

-xx = Maximum number of sequenced breakers.

See right side of page for model number explanation.

Modular Sequencing Load Center



Cabinet Outline
 Isolated Technical Ground Bar
 Feed: 2/0 max.
 Branches: 26 positions, 14 - 4 ga.

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

Standard back-fed Main Breaker: QO3100VH, 100A, (VH = 22kAIR).

Main options — Part# suffix
BOLD FACE=Amps
 -M3030, -M3035 [10kAIR]
 QO3xx

-M3050, -M3060, -M3070 or -M3090
 QO3xxVH [all 22k AIR]
 [Amps Interrupt Rating]

Wire: #4 - 2/0 kcmil Cu.
 Outside dimensions
 20.9" w., 29.8" h., 3.9" d.
 Surface mount only.

See

http://www.lyntec.com/139-0245_MSLC326Plnr.pdf
 for latest version.

Document # 139-0245-14 MSLC 326 Planner 10/28/06

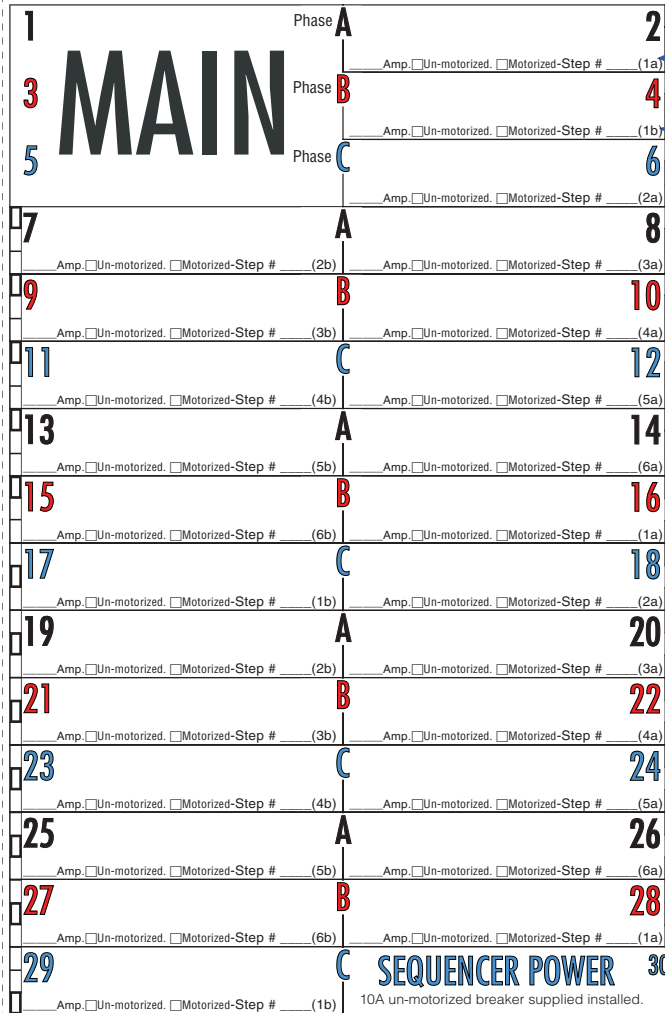
Each motorized breaker is controlled by a sequencer.

As-built door label example:

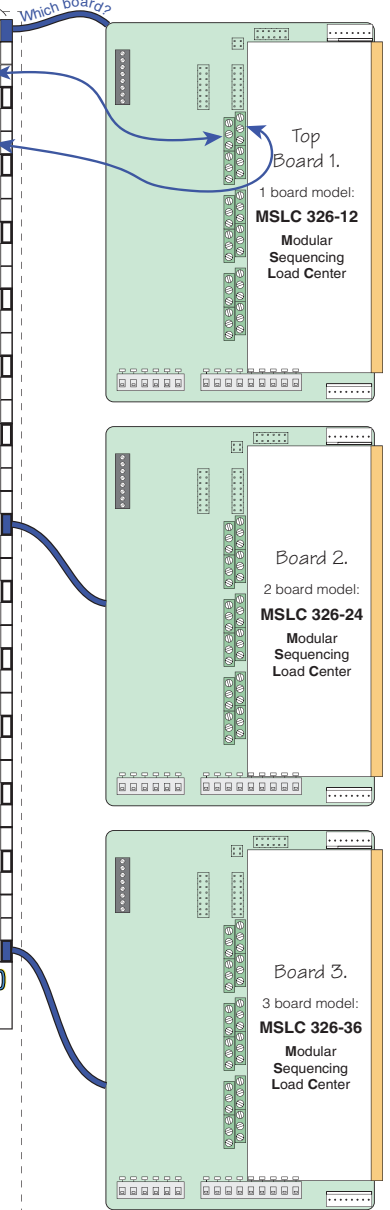
Step # **1a** (1a) (# in parenthesis is *suggested* breaker connection in sequencer).

Bold line around box = *suggested* sequencer board: #1 (Top), #2 or #3.

Fill in box to indicate which sequencer board this breaker is connected to.



MS-12 Sequencer circuit boards in left-hand, low voltage cabinet.



How it works

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

Motorized circuit breakers (marked **REMOVELY OPERATED**) are time sequenced by relays in the adjacent, left-side, low voltage sequencer cabinet.

The **ON** or **OFF** sequence is initiated at remote sound system locations and may be locally tested with the **top** green ON and **bottom** red OFF buttons on the circuit boards.

Sequenced breakers are sequenced on (Steps 1 to 6) and off (Steps 6 to 1) at 1/8 to 1 second intervals and may have a programmed **PAUSE DELAY** of up to 8 minutes during the sequence. These **STEP RATE**, **DELAY TIME** and **DELAY POSITION** settings are set by moveable jumpers inside the sequencer cabinet.

Each 6 step sequencer board controls up to 12 breakers by turning on and off two breakers per step.

The circuit boards are factory daisy-chained, top-to-bottom, with the **Cascade Connector (4 pin)** set.

The **Power & Kill Connector (4 pin)** set carries power, common and Kill signals.

ZIP-OFF load shedding

2 seconds after a power failure, the sequencer turns off all sequenced breakers. When power resumes the sequencer automatically re-sequences the system on.

ZIP-OFF may be demonstrated by turning off the **SEQUENCER POWER** breaker momentarily.

Low voltage control Wiring Diagram located inside left cover.

www.lyntec.com/139-0327_SequencerLV_Wiring.pdf

www.LynTec.com
 800-724-4047
 8-5 Central Time
 146-0208-04 MSLC 326

MS-12 MODULAR SEQUENCER board

The new motorized breaker control system now used in all LynTec Sequencing Load Centers and Panelboards.

This view is configured as a single board system.
The facing page MSP 341 is daisy-chain connected.

24v ac power from transformer

For connection of auxiliary control of motorized breakers 1a and 1b as well as 2a and 2b.
Optional remote RR7 latching 20 amp relays may be driven by Steps 1 and 2 by adding J-RR7 jumpers.
Either of these functions may be fully independent of the sequencer or driven by steps 1 & 2.
Bottom two terminals power auxiliary ON LED indicator.

Emergency Activation contacts.
Dragging a coin down across these contacts turns on the motorized circuit breakers connected to this board.

CR option terminal strip.
Completion Relay provides a DPDT relay contact state change at any field determined step.
May be used for sound system control logic or waking up logic controlled power amplifiers.
CR Active LED lights when relay is activated.

Red LEDs for each breaker pair show a short-time glow for normal charging and motor current.
• When continuously lit a FAULT is indicated.
• A misconnected breaker or incomplete breaker motor transition (locked rotor) will cause a fault.

This ON LED and the ON switch LED flashes during on and off cycle.
LED stays lit at end of ON cycle if power is verified by the last sequencer board.

Local test switches for troubleshooting. Use top ON switch and bottom OFF switch for daisy chained systems.
4 low voltage wires connect to a SS-2 switch set. ON, Pilot and Com to the top board. OFF to the bottom/last board.
Turn on the **first** (top).
Turn off the **last** (bottom).

Connect OFF switch to **LAST** sequencer in daisy-chain

Expansion terminals for daisy chain connections to the next LynTec sequencer cabinet.

Connect Kill to common for instant shutdown.

Right 4 pins are Cascade Connector for easy daisy-chaining within a panel. Remove to run as separate systems.

The Power Voucher inputs are the V+ & V- on the last board in the system. Install a V+ to V- jumper in the LAST board if Power Vouchers are not used.

+5v Logic Output to interface with touch screens mimics the ON LED.

4 pin Power and Kill connector for powering all boards within a panel.

DEFINITION POSITION LEFT 4 Pin Power & Kill RIGHT 4 Pin Cascade

AGC 10 FUSE

POWER J-RR7 1on 2on 1off

STEP RATE Both = 1/8 sec. 1/4 sec. 1/2 sec. None = 1 sec.

DELTA TIME 2 sec. 4 sec. 8 sec. 16 sec. 30 sec. 2 min. 4 min. 8 min.

Timing Diagram: Before 1 2 3 4 5 6 Between Steps

START Press ON switch DELAY TIME and STEP RATE are 1 second if no jumpers are installed.

ON 1A & 1B Each Sequencer Step controls two breakers, one upper set of terminals (A) and one lower set of terminals (B).

UPPER A RED WHITE BLACK LOWER B RED WHITE BLACK

ON 2A & 2B ON 3A & 3B ON 4A & 4B ON 5A & 5B ON 6A & 6B

DO NOT tin with solder. Solder COLD FLOWS under pressure and will eventually loosen.

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

Zoom from page 5

Movable circuit jumpers set field adjustable programming.

For detailed Timing Diagram see http://www.lyntec.com/139-0266_Seq_Timing.pdf

Green ON LED indicators for each pair of breakers give full visual indication of sequencer action and status.

60" Low voltage, motorized breaker control wires are field attached to sequencer board terminals.

Only two of a possible 12 are shown for photo clarity.

Zoom from page 5

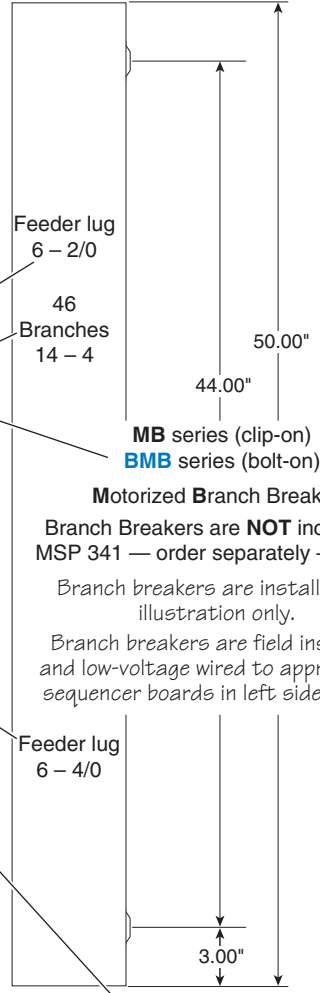
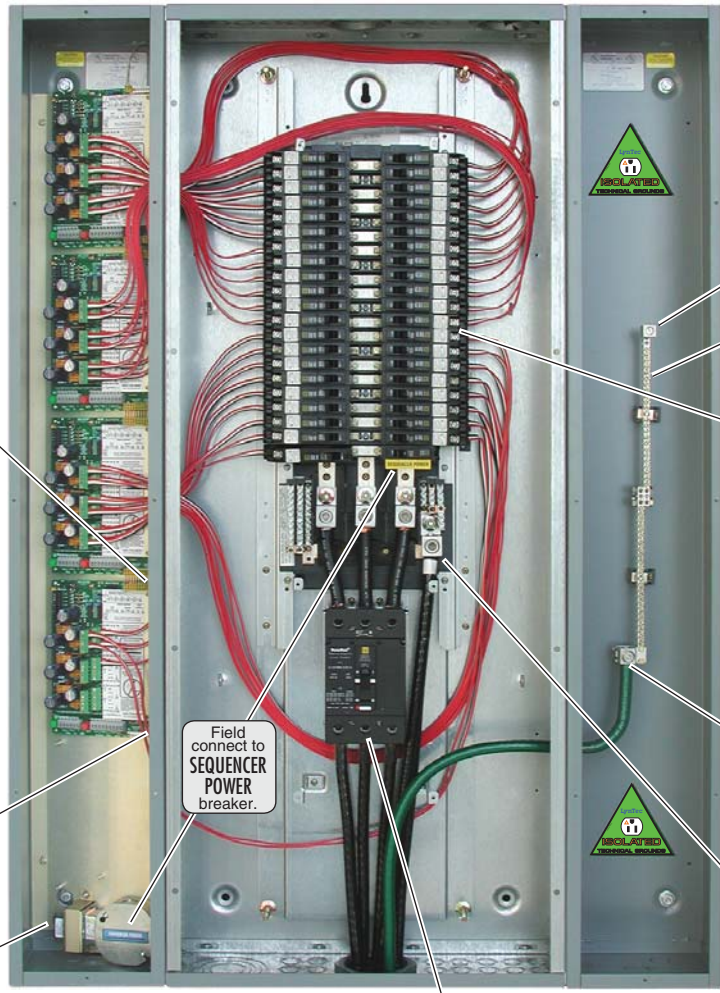
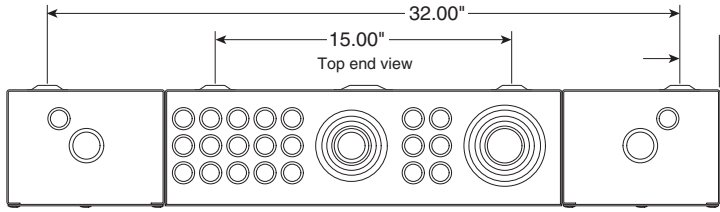


Model shown
MSP 341-48 41/20



Isolated Technical Ground sidecar

Low Voltage Sequencing sidecar



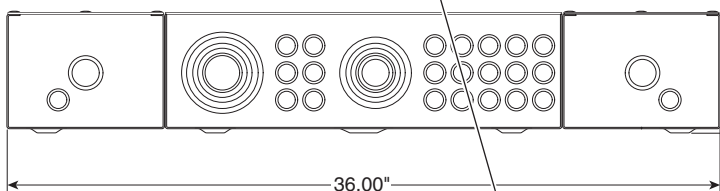
Motorized Branch Breakers
 Branch Breakers are **NOT** included in MSP 341 — order separately — page 7
 Branch breakers are installed for illustration only.
 Branch breakers are field installed and low-voltage wired to appropriate sequencer boards in left sidecar per

Field connect to SEQUENCER POWER breaker.

24v, 40VA power transformer

Zoom to page 4

Zoom to page 4



200% Neutral. Requires two - 4/0 Cu feeders.

QDL32225[25k AIR] or QGL 32225 [65k AIR]
 225 A Main Breaker Standard (65 kVA)
 See pages 2 & 6 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.



Specifier's Guide for LynTec Modular Sequencing Panels

Load Center and Panelboard part number explanation

Blue type items only available for Panelboards.

Optional field installed branch circuit breaker numbers

Panelboards

MSP 341

3 = 3 phase
208/120v, 4 wire
or
1 = 1 phase
120/240v, 3 wire

Single Phase
Panelboards are
Special Order,
NCNR.

41
38 ♦
Number of
available
circuit
breaker
spaces

-36 21/BMB-20 8/BMB-30 5/BUMB-20 -MJG3150

12
24
36
48

60
panelboard only

Sequencer
capacity—
will drive
up to this
number of
motorized
breakers

BMB
Bolt-on
Motorized
breakers

or
MB
Clip-on
Motorized
breakers

BMB
Bolt-on
Motorized
breakers

or
MB
Clip-on
Motorized
breakers

BUMB = Bolt-on
or
UMB = Clip-on

Quantity of
single pole
Un-Motorized
circuit breakers

20
30
Current rating

10
15
20
30
Current
rating

**-Main breaker
&
-Main Lug Only
options
SEE BELOW**

Load Centers

MSLC 326

1 = 1 phase
120/240v, 3 wire
or
3 = 3 phase
208/120v, 4 wire

127 ♦
129 ♣
326
338 ♦
341
Number of
available
circuit
breaker
spaces

Quantity of
lowest current
sequenced
circuit breakers

15
20
30
Current
rating

Load Center — Panelboard

What's the difference?

Panelboards are the electrician's choice because they have over 250% more wiring space. Panelboards are used when bolt-on breakers, 200% neutrals or high circuit counts with heavy isolated technical ground wires are required.

Load Centers are typically used where the circuit count isn't high. They offer the lowest cost.

Factory options — add suffix to part number

-CR-x: Completion Relay option.

Provides SPDT (form C) relay contact that changes state at the completion of any field selectable step.

Add **-CR-x** for each board requiring CR option at time of manufacture. -x is the board position where CR option is desired. Example: MSP 341-36 28/20 4/30 9/UMB20 M150 **-CR-3** would have the CR relay in the 3rd board from the top.

Front-end remote control

Several options are now available for the remote control of ac for the F.O.H, mix position, booth or control room.

See <http://www.lyntec.com/boothoptions.pdf>

Load Center Main Breaker Options

Single Phase Load Center

The standard Single Phase **MSLC 129-xx** has a factory installed, two pole, ♣ 200 Amp main breaker. [22kAIR] (AIR = Amps Interrupt Rating)

Optional main breakers [All 22kAIR]

125A **-M1125**

150A **-M1150** (25 kVA transformer)

175A **-M1175**.

♦ Smaller main sizes are also available by replacing the large block type main breaker with a bracket-retained, clip-on, back-fed, 2 pole, main breaker. [All 10kAIR Amps Interrupt Rating]

30A **-M1030** (5 kVA transformer)

40A **-M1040** (7.5 kVA)

60A **-M1060** (10 kVA)

80A **-M1080** (15 kVA)

Note This modification reduces the number of available branch breaker spaces from 29 to 27, hence a **MSLC 129-xx** becomes a **MSLC 127-xx**.

Small 3 Phase Load Center

The standard **MSLC 326-xx** has a bracket-retained, clip-on, back-fed, 3 pole, 100 Amp main breaker.

In some instances a smaller isolation transformer feeding the panel requires the use of a smaller main breaker.

See ♦ below for optional main breaker sizes available.

Large 3 Phase Load Center

The standard **MSLC 341-xx** has a factory installed, 3 pole, 225 Amp main breaker (65 kVA transformer) [25kAIR Amps Interrupt Rating].

Optional main breakers [All 25kAIR]

150A **-MQD3150** (45 kVA)

200A **-MQD3200** (60 kVA)

♦ Smaller main sizes are also available by replacing the large block type main breaker with a bracket-retained, clip-on, back-fed, 3 pole, main breaker.

♣ 30A & 35A: 10kAIR

♣ 50A up: 22kAIR (Amps Interrupt Rating)

♣ 30A **-M3030** (7.5 kVA transformer)

♣ 35A **-M3035** (10 kVA)

♣ 50A **-M3050** (15 kVA)

♣ 70A **-M3070** (20 kVA)

♣ 90A **-M3090** (25 kVA)

♣ 100A **-M3100** (30 kVA)

Note This modification reduces the number of available branch breaker spaces from 41 to 38, hence a **MSLC 341-xx** becomes a **MSLC 338-xx**.

-MLO (Main Lug Only) option:

We only stock MSLC panels with main breakers. If your specification requires a **-MLO** we will provide it at the same price as the standard panel.

Panelboard Main Breaker Options

The standard MSP 341-xx has a **JGP36225**, 3 pole, 225 Amp main breaker (65 kVA). 65k AIR [Amps Interrupt Rating].

Optional main breakers [All 25kAIR]

125A **-MHG3125** (36 kVA transformer)

150A **-MJG3150** (45 kVA)

175A **-MJG3175** (50 kVA)

200A **-MJG3200** (60 kVA)

Feed thru lugs are **NOT** available on 3Ø NL (Non-Linear) panelboards with 200% neutrals.

♦ Smaller main sizes are also available by replacing large main breaker with a 3 pole, bolt-on, back-fed breaker.

♣ 30A **-BM3030** (7.5 kVA transformer)

♣ 35A **-BM3035** (10 kVA)

♣ 50A **-BM3050** (15 kVA)

♣ 70A **-BM3070** (20 kVA)

♣ 90A **-BM3090** (25 kVA)

♣ 100A **-BM3100** (30 kVA)

♣ 30A & 35A: 10kAIR

♣ 50A up: 22kAIR (Amps Interrupt Rating)

Note This modification reduces the number of available branch breaker spaces from 41 to 38, hence a **MSP 341-xx** becomes a **MSP 338-xx**. **-MLO (Main Lug Only)** is an option.

Single Phase Panelboard

The special order **MSP 141** have the following main breaker options: **MSP 141 -MQG2xxx** series — 65k AIR

Ratings available: **70A, 80A, 90A, 100A, 125A, 150A, 175A, 200A** or 225A.

The UL listed heart of the LynTec Sequencing Panels

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 board feeder finger.

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

Red flag snaps into window when circuit breaker is tripped

Microswitch, behind Actuator arm, opens motor circuit at end of transition.

AC POWER

Spring used as a worm gear drive

Actuator arm

Low voltage motor. Life expectancy: 60,000 On-Off operations.

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!

SEQUENCED AC POWER OUT →

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

Connects to sequencer in low voltage cabinet.

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

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

BMB-15 Bolt-on Motorized Breaker, Square D #QOB115PL-5393

MB-15 Clip-on Motorized Breaker, Square D #QO115PL-5393
One pole, 15 Amps. Special 60" leads. Square D trip curve: 730-4

BMB-20 Bolt-on Motorized Breaker, Square D #QOB120PL-5393

MB-20 Clip-on Motorized Breaker, 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 like power amplifiers.

BMB-30 Bolt-on Motorized Breaker, Square D #QOB130PL-5393

MB-30 Clip-on Motorized Breaker, Square D #QO130PL-5393
One pole, 30 Amps. Special 60" leads. Square D trip curve: 730-5

2 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-sequenced 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.

ACCESSORIES FOR ALL LynTec SEQUENCERS

SS-2 Switch Set

Optional **BONS-1** Booth On Switch

One SS-2 Switch Set is supplied with each panel.

SHOWN ACTUAL SIZE

Up to 5 Switch Sets may be parallel wired for multiple location control.

illuminated green LED

Red

illuminated green LED

.710"

See <http://www.lyntec.com/boothoptions.pdf> for details.

Optional **SS-2PL** Locking Switch Plate
Provides key limited access with visible power verification.

For switches to mount in your panel,
Please Specify
SS-2 Switch Set (SPDT)
SS-32 Switch Set (DPDT)
Consists of **ON** and **OFF** switches.
Mount in 5/8" dia. round holes. 1/4" thick max.

KS-2L Key Switch (SPDT)
Mounts in round 3/4" hole. 1/4" thick max.
Supplied with lock tumbler position label.
Mount on 1" centers.

Optional **SS-2LRP** Locking Switch Set mounted on single-space 19" Rack Panel

Low level or front-end equipment sometimes generates pops or clicks during power-up. Delaying the application of power to the power amplifiers eliminates potential loudspeaker damage due to turn-on transients.

Normally, the low level equipment such as preamps, mixing consoles, tuners, CD players, tape decks and EQ's are powered from the first few A.C. circuits.

Circuits are controlled by one or more MS-12 Modular Sequencer boards

Each MS-12 board has 6 drivers capable of simultaneously driving two each of the 1, 2 or 3 pole **MB** series motorized circuit breakers. Step 1 drives breakers 1a and 1b. Step 2 drives breakers 2a and 2b and so on through step 6. The motorized breakers may be located in any open slot in the panel.

Sequence timing is field programmed by installing push-on jumpers.

Bold face black type = legends printed on MS-12 boards.

STEP RATES

Default, with no program jumpers, is one second per step with no delays.

One jumper selects 1/2 or 1/4 second per step.

Two jumpers in the 1/2 and 1/4 sec. positions set the step rate at 1/8 second.

DELAY TIME and DELAY POSITION jumpers and timing

One (**First**) or two (**Second**) programmable **DELAY TIME**s provide stabilization time for the computers to boot or DSPs to settle.

DELAY TIMES

1 sec, (no jumper), 2, 4, 8, 16 or 30 seconds or 2, 4, or 8 minutes.

Programmable **DELAY POSITION** settings allow selection of a sufficient number of steps to sequence the breakers required. The **First** delay may be positioned before or between any of the 6 steps depending on the first **DELAY POSITION** jumper.

The **Second** delay position is determined by, you guessed it, the second **DELAY POSITION** jumper. Additional delays may be added between higher steps, but their delay times will all be the same as the **Second**.

Energy Storage — Brownout protection — ZipOff Load Shedding

A distributed power supply stores sufficient energy to ZipOff 12 motorized circuit breakers 2 seconds after power falls below 95 volts. This load shedding ZipOff is delayed 2 seconds to prevent power-glitch induced sequencing.

Automatic Restart after power failure or Kill command.

Five seconds after power stabilizes above 105 volts, the on sequence resumes the orderly turn on. A **fast** flashing ON LED indicates the power hasn't been above 105 volts for the last 5 seconds and the sequencer is waiting for the power to stabilize before restarting the on sequence.

Kill — Function changes with **DELAY TIME** settings of 4 sec. or more.

A **Kill** terminal on each MS-12 board provides an instant shutdown (within 100 msec.) when connected to common.

The **Kill** and **HurryOff** functions are modified by **DELAY TIME** settings of 4 sec. or more. When the **DELAY TIME** is set above 2 seconds, the **Kill** & **HurryOff** shutdown stops at the **first DELAY POSITION** encountered.

Example: A red program jumper is installed in **First DELAY TIME** column at the **4 sec.** location. The **DELAY POSITION** jumper (to right of fuse) is set between steps 1 and 2. This setting provides a 4 sec. delay after step 1 for front-end settling time. This 4 second delay is present in both on and off sequences. When the **Kill** or **HurryOff** command is invoked, all circuits down to step 2 will shut off, but the 4 sec. setting will stop the shutdown. This leaves the DSP gear on step 1 on so a reboot won't be required. **Kill** and **HurryOff** is complete with **DELAY TIME** Settings of 1 or 2 sec. Opening the **Kill** connection restarts the on sequence as described above.

HurryOff — the *Ohh... no...* switch

Function changes with **DELAY TIME** settings of 4 sec. or more — See **Kill** above

When you **REALLY** want to shut the system down in a hurry, due to system oscillation or other problem, a **HurryOff** command may be invoked by holding **any** OFF button down for at least 2 seconds. **HurryOff** shuts the system off completely in 2.1 seconds. To provide the operator time to isolate and correct the problem, there is no automatic restart after a **HurryOff** command. The system must be manually restarted by pressing the ON switch.

Indicator LEDs

Power to each MS-12 circuit board is indicated by the amber **POWER** LED.

Green cylinder LEDs, adjacent to each terminal block, light when the ON control voltage is available to the circuit breaker motor.

Red **FAULT** LEDs glow temporarily at initial **SEQUENCER POWER** breaker turn-on and when the breaker motor actuates. This glow indicates normal capacitor charging or motor current. Any incorrectly connected breaker or a breaker that fails to complete the switch function will cause the **FAULT** LED to light continuously. When the fault is cleared, the **FAULT** LED extinguishes.

This distributed power supply isolates and indicates faults while the rest of the breakers sequence normally.

Remote Control Characteristics

To begin the ON or OFF sequence, a momentary contact to common of at least 30 milliseconds is required to initiate an ON or OFF function of the sequencer. Momentary contacts are necessary when more than one control location is required. ON and OFF line characteristics: +35 volts DC fed through 6900Ω (ON) and 4700Ω (OFF)

ON/OFF Switch Set Supplied

The one supplied **SS-2** Sequencer ON and OFF Switch set provides switches with built-in film legends. The ON switch is backlit by an internal 12v @ 10 ma. green LED. The **SS-2** switches mount in 5/8" round holes on 1" centers.

Additional switch sets may be parallel wired for up to 5 remote control locations. See Page 7 for other switch options.

Remote Pilot LED Output

60 Hz Half-wave pulsed +18 volts (7.5v rms) flashed at a 50%, 1 Hz rate, will drive remote pilot **ON** LEDs up to 200 milliamperes. Incandescent indicator lamps are not recommended.

All **ON** LEDs flash once per second during the on or off sequence cycle. All **ON** LEDs glow continuously at the end of the ON cycle **if** the **last** board in a daisy-chained system has its **VOUCHER SUPPLY [V+]** and **VOUCHER SENSE [V-]** terminals bridged by a resistance of less than 100 KΩ.

Power Verification – POWER VOUCHER Sense

The **V-**, **VOUCHER SENSE** input annunciates a completed sequence by switching the flashing **ON** LED to constant, indicating a full **ON** condition.

This AND type input is utilized when LynTec **POWER VOUCHER**s are used to *prove* all sequenced receptacles have AC power present. (No circuit breakers are off, all receptacles are live)

The LynTec **POWER VOUCHER** was discontinued in 2005 and there is no replacement.

Jumper the **V+** and **V-** terminals on the **last** board if power verification is not used.

+5v Logic Output

A clean logic level output that mimics the **ON** LED for touch screen drive. Pulses during sequencing, high at the end of on sequence.

Source Impedance: 3.3 KΩ from +5v.

For detailed Timing Diagram see http://www.lyntec.com/139-0266_Seq_Timing.pdf

ON/OFF Low Voltage Connections

Lever actuated cage clamp terminals accept wire sizes from 18 to 24 gauge.

Motorized Circuit Breaker Low Voltage Connections

Each motorized breaker is powered by a 3 wire low voltage field connection to the screw terminal strips on sequencer circuit board/s.

Control Wire Requirements

From ON/OFF switch location to one LynTec sequencing panel:
4 conductors, 24 gauge, 5,000 ft. maximum

Between multiple MSLCs, MSPs, SLCs, SPs or PDS-8s when daisy chained:
7 conductors, 24 gauge, 5,000 ft. maximum

9 conductors if ON/OFF switches are required at each sequencer location.
11 conductors if **POWER VOUCHER**s are used.

SEQUENCER POWER

The **SEQUENCER 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**, listed, transformer is impedance protected with an internal thermal fuse.

Each sequencer board is protected by an on-board AGC 1/2 amp fuse.

Power required: 50/60 Hz, 4 watts per board with one external ON LED load. 20 watts maximum per panel.

For product specific ARCHITECTS & ENGINEERS SPECIFICATIONS see <http://www.lyntec.com/products/ac-power-control> and click on the desired model.

In the interest of product improvement, specifications are subject to change without notice — see web site for the most current data.

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