# LynTec AC Power Sequencing Products <br> A composite document of Brochures • Installation Instructions • AppNotes 

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# SOUND SYSTEM A.C. POWER 

## OPERATING INSTRUCTIONS

for
LynTec A.C. Power Sequencing Systems

To turn ON the sound system press this button.

The ON light will start flashing and continue until the system is fully ON.

This sequence will take from 16 seconds to over a minute depending on how many circuits are being sequenced.

The light will stay on constantly when the system is fully powered.

AC Power failure scenario
The sequencer will ZIP-OFF the system 2 seconds after power fails. System will automatically re-sequence ON when power resumes


To turn OFF the sound system press this button.

The ON light will start flashing and continue until the system is OFF.

This sequence will take from 16 seconds to over a minute depending on how many circuits are being sequenced.

The ON light will extinguish at the end of the OFF sequence.

The OFF button is not illuminated.

## For LynTec MSLC and MSP MODULAR and PDS-I 0 Power Sequencing Products

Showing Low-Voltage Remote ON/OFF Control and Daisy-Chain Wiring

Custom switch legends you can print on your laserprinter
See http://www.lyntec.com/139-0309_CSLF-1_Film.pdf

For single sequencer board hookup connect OFF switch normally open to OFF.

One set of the ON and OFF switches shown below are supplied unmounted as a SS-2 Switch Set with each LynTec sequencer cabinet Mount in $5 / 8^{\prime \prime}$ dia. round holes in panels up to $1 / 4^{\prime \prime}$ thick.

Locking Swich Set. (Optional)

Switch layout for field constructed panel mounting. 1/4" max. panel thickness.



146-0231-08 3/25/05


mad



Kill - Fire alarm shutdown
External contact closure lights the red Kill LEDs and kills all sequenced power. Contact opening restarts the ON sequence.

P1 Parallel connect additional SS-2 switch sets for multiple remote control locations. 4 conductors, 24 ga., 5,000 ft. loop max.

Maximum number of switch sets:
All LynTec sequencers support 6 switch sets.

## LynTec

Lenexa, KS (Central time zone) U.S.A. Voice 800-724-4047 or 913-529-2233 Fax 888-722-4157 or 913-529-4157 www.LynTec.com

## A typical LynTec three panel, daisy-chained system with two locking control locations.

For Timing Diagram and Logic levels
See http://www.lyntec.com/139-0266_Seq_Timing.pdf


# Built-in Kill, Hurry-Off and ZipOff (PANC) switch option for MSLC and MSP and PDS-10 series AC SEQUENCING SYSTEMS 

## What the functions do

## Kill - EMERGENCY SHUTDOWN

Provides an IMMEDIATE shut down method for the sound system at the command of a fire alarm, emergency announcement system, or ZipOff switch.

## Optional ZipOff switch, ZOS-5K

Provides a full AC Power shutdown within 200 milliseconds after the ZipOff button is pushed. In case of a runaway oscillation or other unexpected signal which could damage the loudspeakers if sustained...
Lift the protective cover and press the ZipOff button... it latches down and lights red. The AC power sequencing system immediately zips off.
Press again to unlatch... the light goes out and the sequencer restarts to repower the system.

> or

Use the new Hurry-Off function at any OFF switch.

## MULTI-BOARD SHUNT R

The Kill line is an 11 ma. current source from each MS-12 Modular Sequencer or PDS-10 board

A voltage sensor on the Kill line determines the Kill threshold.
The Kill line has an open circuit voltage of 28 volts which must be pulled down to less than 10.5 volts to generate a Kill function. Grounding the Kill line to Common will always kill the system instantly. This current source may also be used to light the Zip-Off switch's, red LED.

The red ZipOff LED only requires 10 ma . For systems where multiple-board system's Kill lines are paralleled, a 9 v . voltage regulator chip is installed in the ZOS-5K which will automatically shunt the excess source current of up to 5 boards. For more than 5 boards an additional resistor must be used in parallel with the ZipOff switch LED. To prevent damage due to overheating the voltage regulator chip, the resistor should be installed as shown with full length leads to get the heat source away from the switch.

| Total Number of boards 1-5 $\qquad$ | Shunt Resistor required ........none |  |
| :---: | :---: | :---: |
| 6........ | .....820 ${ }^{\text {, }} 1 / 4 \mathrm{w}$ | $16 . . . . . . . . . . . . .75 \Omega, 2 w$ |
| 7........... | ...430 , 1/4w | $17 . . . . . . . . . . . . . .68 \Omega, 2 w$ |
| 8......... | ..270 2 , 1/2w | $18 . . . . . . . . . . . . . .62 \Omega, 2 w$ |
| 9........ | .200ת, 1/2w | 19.............. $56 \Omega$, 2w |
| 10....... | ..150 2 , 1/2w | $20 . . . . . . . . . . . . . .56 \Omega, 2 w$ |
| 11......... | ... 150 , 1w | 21..............51 2 , 2w |
| 12........ | ... 120ת, 1w | 22 ...............47S, 2w |
| 13........ | ... 100 1 , 1w | $23 . . . . . . . . . . . . . .47 \Omega, 2 w$ |
| 14........ | ..... $92 \Omega$, 1w | $24 . . . . . . . . . . . . .43 \Omega, 2 w$ |
| 15........ | .... 82, 1w | $25 . . . . . . . . . . . . . .39 \Omega, 2 w$ |

## What to specify or order

For ZipOff switch order ZOS-5K. (services up to $\mathbf{5}$ Kill equipped boards) on reverse side Includes switch with ZipOff film legend and flip up security cover.
Switch mounts in $5 / 8$ " round hole in panels up to $3 / 16^{\prime \prime}$ thick.
ZOS-5K Contractor C.O.D. price: $\$ 34$.

## Hurry-Off

The MS-12 Modular \& PDS-10 Sequencing boards have a new Hurry-Off function. If you hold down any OFF switch for two seconds, a "Kill without restore" function is triggered. The system shuts down within 200 milliseconds and doesn't restart until you give it a new ON command.

## How they work

All LynTec sequencing systems have the ZipOff load shedding feature. The older SLC, SP and PDS-8's implemented it by interrupting 24 v ac power.
The newer Modular sequencers, the MSLC and MSP series and the PDS-10, load shed when power fails, but also have a Kill function that is triggered by grounding the Kill line.
The red Kill LED, adjacent to the Kill terminal on the board, lights and Zip-Off is immediate. The kill line is a low current line. Long control wiring may be used without concern for loop resistances up to 32ת. (22 gauge, up to a $1,000 \mathrm{ft}$. run [ $2,000 \mathrm{ft}$. loop] or a 680 ft . run of 24 ga ).
The microprocessor remembers that the sequencer was ON. When the Kill line is opened, the ON sequence repeats, bringing the AC power back on.
For the Modular series control boards the ZipOff switch connects the Kill line to common, through the Zip-Off switch's LED, initiating the Kill function.

## LynTec

for Modular A.C. Sequencing Systems, models MSLC, MSP \& PDS-I 0.
ON, OFF and ZipOff switch mounting \& wiring


SHUNT Resistor required for more than 5 sequencer boards. See reverse side.

To PDS-10 series or MSLC, MSP series sequencer


## Wire requirements

Switch set to sequencer: 4 conductors.
Between daisy chained Modular sequencers:
9 conductors, 11 if Power Vouchers are used.
Up to 5,000 ft run: 22 ga.,
5,000 to 7500 ft. run: 20 ga.
7,500 to $10,000 \mathrm{ft}$. run: 18 ga .
See other side for ZipOff wire sizing.

## POWER VOUCHER ${ }^{\text {TM }}$.....from LynTec

- Used to verify the presence of power at all AC circuits of a sound system
- A safe, solid-state AC power sensor
- Replaces labor-intensive relay assembly - Cost effective - Optically isolated from AC line
- Visual indication on rack power strips, green LED when power is on.

When used with any LynTec power sequencer, the PV-110's complete a closed loop system.
The operator is assured of a fully powered sound system when his AC control switch ON light stays on at the end of the turn-on sequence. If any circuit is un-powered due to breaker trip or unauthorized shut-off, that PV-110's LED will extinguish and signal the sequencer to extinguish the sound system AC ON light, warning the operator that the system is not all ON.


## Who Needs it?

Any sound system with more than 2 AC circuits.
Why? If a circuit breaker is tripped, you need to know. Part of the system can be off and no one knows why the sound system isn't operating properly.

## Return to Table of Contents

TYPICAL CONNECTIONS
when used with a LynTec AC Power Sequencer.
PDS-8 series, PDS-16, SLC or SP series power sequencing systems.
For FULL verification use a PV-110 in every AC circuit, sequenced or not.


www.TTnTec.com
8401 Melrose Drive • Lenexa, KS 66214 (suburb of Kansas City)
139-0113-09 5/24/05
NOT for new designs - Discontinued 5/O5-No replacement

## LynTec PDS-10 series Power Delay Sequencer

Relay based power sequencer for sound systems - Turns on front-end gear first, power amplifiers last Protects expensive loudspeaker systems from damaging power-on or power-off click \& pop transients

- Tested, complete package - low labor - mount next to any circuit breaker panel to sequence AC power "hot" lines
T 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

D 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 - low voltage electronics are isolated.
- 4,8 or $1020 / 30$ A circuits - 120 or 240 volt models available
- Up to 6 One Touch remote control locations possible
- Kill function uses external contact for instantaneous shutdown.
- HurryOff function shuts down immediately if you hold down any OFF button for 2 seconds. Great for Ohh.... no........ situations.
- Daisy-chains for unlimited circuit count. Interfaces with LynTec MSLC, MSP, SLC, SP or multiple PDS sequencing systems.



## New Features

- Multiple delay options.
- Variable step rate
- Completion contact option on last step can be used for additional indicators or to trigger more equipment.

ONE TOUCH
REMOTE POWER CONTROL
SHOWN ACTUAL SIZE


Green LED illuminated

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

## How they work

Applies AC to low level, frontend electronics... waits for them to stabilize... (clicks and pops are ignored by un-powered power amplifiers)...
$A C$ is then sequenced to power amplifiers spreading high inrush currents over time.

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

## pos-10 series inverion and WIniNe



Supplied SS-2 remote Switch Set - Actual Size


Wiring: Typically "half" of a Cat 5 cable. 4 conductors - 22-26 ga. - 5,000 ft. max.


Switches mount in $5 / 8^{\prime \prime}$ dia. round holes on 1 " centers in material up to $1 / 4^{\prime \prime}$ thick. Solder wire connections.

## PロS-10 series MECHANIEAL



## OTHER LynTec GEOUENCING PROQUCTS

## Switch Set OPTIONS

SS-2PL or SS-32PL Locking Switch Set


SS-2PL is an SS-2 Switch Set and a KS-2L mounted on a single gang stainless steel PLate. The SS-2 switches are momentary SPDT. The KS-2L Key Switch is SPDT.

SS-32PL is an SS-32 Switch Set and a KS-2L mounted on a single gang stainless steel PLate The SS-32 switches are momentary DPDT with a spare set of contacts for control of other equipment.

SS-2LRP or SS-32LRP Locking Switch Set


Ideal for new construction that requires a breaker panel anyway.

## - MSLC series Modular Sequencing Load Centers

- MSP series Modular Sequencing Panelboards

One-panel solution combines a circuit breaker panel with up to 5 AC power sequencers. ONE TOUCH controls - wide range of field-selected time delays and sequence step rates Utilize Square D panels and motorized, remotely operated, circuit breakers
12, 24, 36 or 41 circuits - cascade (daisy chain) for more circuits
Unlimited circuit design flexibility - One, two or three pole motorized (QOPL) or un-motorized (QO) circuits - 15, 20 or 30 Amps per circuit
Available in Single Phase, 3 wire, 120/240v., 3 Phase, 4 wire, 208Y/120v., or 60v-0-60v Balanced Power.
Interface with PDS-8EK sequencer and earlier LynTec sequencers

- MRTS Modular Rain Tight Sequencer

Add One Touch sequential control of motorized breakers to any Square D QO series panel.


- LynTec also makes DMX and Ethernet controlled panels for individualized control of non-dimmed lighting circuits.


## SPECIFICATIONS - LOW VOLTAGE SECTION - Class 2

## RELAY CONTROL CIRCUITS

10 ON and 10 OFF RR7P3 relay coil drivers.

## RELAY DRIVER CHARACTERISTICS

Each 3 pin header is connected to ON and OFF open collector NPN transistors. Built-in reverse EMF snubber diodes connect from the collector to the sequencer's built-in +35 volt supply.
Relay drive capacity: One RR7 coil ( 530 mA . max.) NEVER parallel relay coils! Relay ON/OFF pulse width and spacing: Variable

## RELAY SOURCE - ZIP-OFF LOAD SHEDDING

The +35 volt internal dc relay supply has a PULSE CURRENT indicator for visual as well as aural troubleshooting. Each time the LED flashes a relay should click.
All latched-on relays are zipped-off 2 seconds after power fails, shedding the load. ZIP-OFF minimizes the surge load when power resumes.
The sequencer remembers if the system was ON and automatically re-sequences when power resumes. No manual reset is required.
Short protection: A 0.75A Fuse protects in the event of a short.

## REMOTE CONTROL CHARACTERISTICS

A momentary contact from ON or OFF to COMmon is required to tactivate the ON or OFF function in the sequencer.
The SS-2 Sequencer Switch Set (one set supplied, up to 6 supported) provides easy-to-mount switches, with built-in film legends, to remote control the AC power. Switches are IDEC AL6 series.
Mount in $5 / 8^{\prime \prime}$ diameter round holes on $\geq 1$ " centers.
Typical remote switch current: 9 milliamperes.
Minimum closure time to initiate sequence: 25 milliseconds.
Open circuit voltage appearing at ON and OFF terminals: +30 to +35 volts.

## REMOTE PILOT LED OUTPUT

Pulsed 12 volts DC will drive remote pilot ON LEDs up to 200 ma . or 6 - SS-2's.
All pilot LEDs flash once per second during the sequence cycle.
All pilot LEDs glow continuously at the end of the ON cycle if the POWER VERIFICATION terminals are bridged by a resistance lower than $100 \mathrm{~K} \Omega$. Output protection: Short circuit protected, automatically resets after fault clears.

## LOW VOLTAGE CONNECTIONS

Relays: 3 position, .156 " center male headers to mate with GE RR7P3 relays. 5 position, .156 " center male headers to mate with GE RR9P5 relays for CR option.

Remote Control Wiring: 4 conductor, 22-26 gauge wire, solder to SS-2 Switch Set and connect to spring-lever actuated, cage-clamp terminals in the sequencer.

## LOCATING RR7 RELAYS REMOTELY

In some instances it is desirable to locate one or two RR7 relays at a location other than the PDS-10 cabinet. Example: Control room electronics need to be sequenced but they are located several hundred feet from the power amplifier racks. The PDS-10 is located near the power amp racks. RR7's may be driven remotely via a 3 wire, low voltage cable for one or a 5 wire cable for two relays.
Wire sizing minimums: $\leq 75 \mathrm{ft}$. run, use 22 ga., $\leq 125 \mathrm{ft}$. run, use 20 ga., $\leq 200 \mathrm{ft}$., use 18 ga., $\leq 300 \mathrm{ft}$. run, use 16 ga. RULE: Keep loop resistance $\leq 2.5 \Omega$.
Connect to PDS-10 board mounted plugs with AMP or Molex 3 pin housing: Digi-Key WM2123-ND \& 3 crimp pins per relay: Digi-Key WM2300-ND. Five pin connector for CR option is Digi-Key part \# WM2103-ND.
Digi-Key: 800-344-4539. Independent control of these remote relays is also possible. Example: Turn on control room only. Call LynTec for details.

PDS-10 POWER SOURCE REQUIREMENT
24 volts AC, $50 / 60 \mathrm{~Hz}, \leq 6$ watts.

## SPECIFICATIONS - HIGH VOLTAGE SECTION — Class 1

## AC POWER CONTROL

GE RR7 and RR9 Relay ratings - see page 2
NOTE Tungsten lamps have high inrush currents similar to power amplifiers.

## SEQUENCER POWER TRANSFORMER

| INPUT VOLTAGE | Standard PDS-10: 120 volts $\pm 15 \%$ |
| :--- | :--- |
| overseas PDS-10: 240 volts $\pm 15 \%$ |  |
| FREQUENCY | $50 / 60 \mathrm{~Hz}$ |
| OUTPUT VOLTAGE | 24 volts @ 40 VA., 27 volts, No Load. |
| UL Listed | 428L, Class 2 B6 |
| CUL Listed (Canadian) | 428 L, Class 2 B6 |
|  | 120 volt: (Dormeyer \# DCT-40-120) |
|  | 240 volt: (Dormeyer \# DCT-40-240) |

The sequencer power transformer should be connected to a separate 10 Amp circuit breaker and labelled SEQUENCER POWER.

## CABINET

GE RBS2 REMOTE CONTROL CABINET - surface mount
Type 1 Enclosure "INDOOR USE ONLY" — UL Listing: 508G Industrial Control Equipment MECHANICAL
Size: $12.4^{\prime \prime}$ square $\times 3.5^{\prime \prime}$ high max. Cover attached with 4 - 10-32 screws.
Mounting: Cabinet has 4 raised mounting dimples with $1 / 4^{\prime \prime}$ holes on 10 " vertical and horizontal centers for surface mounting.
Orientation: Any position. Weight: 15 lb .
Shipping Weight: 17 lb . Shipping size: $15.5^{\prime \prime} \times 15.5^{\prime \prime} \times 6.5^{\prime \prime}, .9 \mathrm{cu} . \mathrm{ft}$.
G-E \& General Electric are registered trademarks of the General Electric Company.

## SPECIFYING \& ORDERING DETAILS

Any number of LynTec sequencers may be daisy-chain cascaded; PDS-8EK's, MSLC \&
SLC series Sequencing Load Centers or MSP \& SP series Sequencing Panelboards.
PDS-10 Power Sequencing System
Includes: Cabinet and cover with the following installed: $120 \mathrm{v}, 50 / 60 \mathrm{~Hz}$ power transformer, sequencer, and 10 ea. GE RR7P3 relays. One SS-2 switch set is supplied.
PDS-10-4
Same as above but only loaded with 4 RR7P3 relays for four circuits.
PDS-10-8
Same as above but loaded with 8 RR7P3 relays for eight circuits.
PDS-100V , PDS-10-8KOV PDS10-40V
overseas part number suffix for $240 \mathrm{v}, 50 / 60 \mathrm{~Hz}$ operation.
A GE RR9 relay can be added in the \#10 position to provide completion contact capability. Please indicate the CC option when specifying. (ex. PDS-10CC)
SS-2 Switch Set.
OFF and illuminated ON switches with built-in film legends. One set included with each PDS-10 system, Up to 6 total supported for multiple location remote control.
SS-2PL Locking Switch Plate (photo on page 3)
A locking key switch to restrict access installed with a SS-2 switch set in a single gang stainless steel wall plate. ON and OFF switches may be field rotated for horizontal mounting. All locks are keyed alike.
SS-2LRP Locking Rack Plate (photo on page 3)
A locking key switch to restrict access installed with a SS-2 switch set in a single rack plate. All locks are keyed alike.
RR7P3 Latching relay. (P3 = 3 pin,. $\mathbf{1 5 6}^{\prime \prime}$ Plug). (photo on page 2)
For more than 10 circuits, 208 v . circuits or 30A circuits see
MSLC series Sequencing Load Centers or MSP series Sequencing Panelboards (photo on page 3).

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



MSLC 326-xx
Modular Sequencing Load Center
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.


## $\checkmark$ 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 - lastslong.

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)...
$A C$ 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 CONTROLSHOWN ACTUAL SIZE


## SS-2 Sequencer Switch Set

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

## 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.
(V) 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
MSP 139
Use a 2 pole, back-fed main breaker, rated at 100 AMPS or less. 22kAIR
LynTec
LCLC 326
MSLC 326
MSLC 338
MSP 338
Use a 3 pole, back-fed
main breaker, rated at
100 AMPS or less.
QO3xxVH Series
22kAIR

POWERPACT Q-frame $\triangle$ - 250 A , Thermal-magnetic ( 240 Vac )

| Current <br> Rating <br> @ $40^{\circ} \mathrm{C}$ | AC Magnetic <br> Trip Settings |  | D Interrupting | G Interrupting |
| :---: | :---: | :---: | :---: | :---: |
|  | Hold | Trip | Catalog <br> Number | Catalog <br> Number |


| 2-pole, 240 Vac |  |  |  |  |
| :---: | ---: | :--- | :--- | :--- |
| 70 | 1000 | 1800 | QDL22070 | QGL22070++ |
| 80 | 1000 | 1800 | QDL22080 | QGL22080++ |
| 90 | 1000 | 1800 | QDL22090 | QGL22090++ |
| 100 | 1200 | 2400 | QDL22100 | QGL22100++ |
| 110 | 1200 | 2400 | QDL22110 | QGL22110++ |
| 125 | 1200 | 2400 | QDL22125 | QGL22125++ |
| 150 | 1200 | 2400 | QDL22150 | QGL22150++ |
| 175 | 1200 | 2400 | QDL22175 | QGL22175++ |
| 200 | 1200 | 2400 | QDL22200 | QGL22200++ |
| 225 | 1200 | 2400 | QDL22225 | QGL22225++ |
| 250 | 1200 | 2400 |  |  |

LynTec
MSP 119
MSP 141
++ All models 70-225A
Special order, NCNR
Non Cancelable

| Current Rating <br> @ $40^{\circ} \mathrm{C}$ | AC Magnetic Trip Settings |  | D Interrupting | G Interrupting |
| :---: | :---: | :---: | :---: | :---: |
|  | Hold | Trip | Catalog Number | Catalog Number |

3-pole, 240 Vac

| 70 | 1000 | 1800 | $\begin{aligned} & \text { QDL32150 + } \\ & \text { QDL32175 } \\ & \text { QDL32200 + } \\ & \text { QDL32225 } \end{aligned}$ | QGL32070 |
| :---: | :---: | :---: | :---: | :---: |
| 80 | 1000 | 1800 |  | QGL32080 |
| 90 | 1000 | 1800 |  | QGL32090 |
| 100 | 1200 | 2400 |  | QGL32100 |
| 110 | 1200 | 2400 |  | QGL32110 |
| 125 | 1200 | 2400 |  | QGL32125 |
| 150 | 1200 | 2400 |  | QGL32150 |
| 175 | 1200 | 2400 |  | QGL32175 + |
| 200 | 1200 | 2400 |  | QGL32200 |
| 225 | 1200 | 2400 |  | QGL32225 + |
| 250 | 1200 | 2400 |  |  |
|  |  |  | LynTec | LynTec |
|  |  |  | LCLC 341 | MSLCH 341 |
|  |  |  | MSLC 341 | + Optional from stock |
|  |  |  | > Standard |  |
|  |  |  | Optional from stock |  |

A Replacement lugs are not available for POWERPACT Q-frame circuit breakers. Lugs for the POWERPACT Q-frame circuit breakers accept (1) \#4-300 kcmil.

Interrupting Ratings (kA)

|  | QD | QG |
| :---: | :---: | :---: |
| 240 V | 25 | 65 |

For Branch Breaker Series Ratings
see http://www.lyntec.com/139-0407_Series_Ratings.pdf

H - and J- frame Thermal-magnetic Molded Case
150 and 250 Ampere Frame - Class 611

|  |  | 150 A H-frame |  |  |  | 250 A J-frame |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | LynTec LCP341-xx MSP 341-xx <br> Main breaker suffix $\begin{aligned} & -M H G 3110=110 \mathrm{~A} \\ & -M H G 3125=125 \mathrm{~A} \end{aligned}$ <br> Special Order Option NCNR Non Cancellable |  |  |  |  |  | The a JG | nTec <br> 341-xx <br> 341-xx <br> main breaker is and requires no number. $\begin{aligned} & \text { er suffix options } \\ & 50=150 \mathrm{~A} \\ & 75=175 \mathrm{~A} \\ & 00=200 \mathrm{~A} \\ & 25=225 \mathrm{~A} \end{aligned}$ |
| Circuit Bre | er Type | HD | (HG) | HJ | HL | JD | (JG | JJ | JL |
| Number of | les | 2,3 | 2,3 | 2,3■ | 2,3■ | 2,3■ | 2,3п | 2,3■ | 2,3■ |
| Current Ra |  | 15-150 A | 15-150 A | 15-150 A | 15-150 A | 150-250 A | 150-250 A | 150-250 A | 150-250 A |
| Interrupting Ratings |  |  |  |  |  |  |  |  |  |
| $\begin{aligned} & \text { UL } \\ & \text { CSA } \\ & \text { NOM } \\ & 50 / 60 \mathrm{~Hz} \end{aligned}$ | 240 V | 25 | 65 | 100 | 125 | 25 | 65 | 100 | 125 |
|  | 480Y/277 Vac | 18 | 35 | 65 | 100 | 18 | 35 | 65 | 100 |
|  | 480 Vac | 18 | 35 | 65 | 100 | 18 | 35 | 65 | 100 |
|  | $600 \mathrm{Y} / 347 \mathrm{Vac}$ | 14 | 18 | 25 | 50 | 14 | 18 | 25 | 50 |
|  | 600 Vac | 14 | 18 | 25 | 50 | 14 | 18 | 25 | 50 |
| DC Ratings | 125/250 Vdc | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
|  | 500 Vdc | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| IEC 947-2 Icu/lcs | 220/240 Vac | 25/25 | 65/65 | 100/100 | 125/125 | 25/25 | 65/65 | 100/100 | 125/125 |
|  | 380/415 Vac | 18/18 | 35/35 | 65/65 | 100/100 | 18/18 | 35/35 | 65/65 | 100/100 |
|  | 500/525 Vac | 14/14 | 18/18 | 25/25 | 50/50 | 14/14 | 18/18 | 25/25 | 50/50 |

## Special Ratings

| Fed. Specs W-C-375B/GEN | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| HACR (2, 3-pole) | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |

## Connections/Terminations

| Unit Mount | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| I-Line |  | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |
| Rear Connection | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark \Delta$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |
| Drawout | $\checkmark \mathbf{\Delta}$ | $\checkmark \mathbf{\Delta}$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |  |
| Optional Lugs | $\checkmark \mathbf{\Delta}$ | $\checkmark \mathbf{\Delta}$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |  |
| Unit Mount | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |


| Accessories and Modifications <br> Shunt Trip <br> Undervoltage Trip$\quad \checkmark$ |  |  |  |  |  |  |  | $\checkmark$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |

Trip System Type

| Thermal-magnetic |  | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Instantaneous-only (MCP) |  | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | ... |
| Molded Case Switch (Automatic) |  | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ |
| Electronic |  | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | $\ldots$ | . |
| Dimensions |  |  |  |  |  |  |  |  |  |
| Dimensions (3P Unit Mount) | Height IN (mm) | 6.4 (163) |  |  |  | 7.5 (191) |  |  |  |
|  | Width IN (mm) | 4.1 (104) |  |  |  | 4.1 (104) |  |  |  |
|  | Depth IN (mm) | 3.4 (86) |  |  |  | 3.4 (86) |  |  |  |

[^0]
## For Branch Breaker Series Ratings

see http://www.lyntec.com/139-0407_Series_Ratings.pdf
Series Ratings
For NQOD and NF Panelboards
Class 1630, 1670 same enclosure or a remote main located in a separate enclosure


[^1]GQUARE D
www.SquareD.com
For the most up-to-date information
This page contains UL Tested and Certified series combination ratings for panelboards. These ratings apply to either an integral main located in the

NQOD Series Ratings (Continued)

|  |  | Integral or Remote Main Circuit Breakers and Remote Main Fuses | Branch Circuit Breaker Designations and Allowable Ampere Ranges ab |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Type | 1-pole | 2-pole | 3-pole |
|  | 100k | HJ, JJ HL. JL | QO (B) <br> QO (B) VH <br> QO (B) GFI <br> QO (B) PL <br> QO (B) AFI <br> QO (B) H QOB2150V <br> QOB2150VH | $\begin{array}{\|c} 15-70 \mathrm{~A} \\ 15-30 \mathrm{~A} \\ 15-30 \mathrm{~A} \\ 15-2 \mathrm{~A} \\ \ldots . \\ \ldots \end{array}$ | 15-125 A <br> 15-60 A <br> 15-60 A <br> 15-100 A <br> 150 A | $\begin{aligned} & 15-100 \mathrm{~A} \\ & 35-150 \ldots \\ & 15-30 \mathrm{~A} \end{aligned}$ |
| 240 | 200k | FI, KI | QO (B) <br> QO (B) AS <br> QO (B) GFI <br> QO (B) AFI | $\begin{aligned} & 15-70 \mathrm{~A} \\ & 15-30 \mathrm{~A} \\ & 15-30 \mathrm{~A} \\ & 15-20 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & 15-125 \mathrm{~A} \\ & 15-30 \mathrm{~A} \\ & 15-60 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & 15-100 \mathrm{~A} \\ & 15-30 \mathrm{~A} \end{aligned}$ |
|  | 200k | Maximum Fuses 200 A Class J or T6 400 A Class T3 | $\begin{aligned} & \hline \mathrm{QO} \text { (B) } \\ & \mathrm{QO} \text { (B) } \mathrm{AS} \\ & \mathrm{QO} \text { (B) } \mathrm{GFI} \\ & \hline \end{aligned}$ | $\begin{aligned} & \hline 15-70 \mathrm{~A} \\ & 15-30 \mathrm{~A} \\ & 15-30 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & 15-125 \mathrm{~A} \\ & 15-30 \mathrm{~A} \\ & 15-60 \mathrm{~A} \end{aligned}$ | $\begin{aligned} & 15-100 \mathrm{~A} \\ & 15-30 \mathrm{~A} \end{aligned}$ |

Suffixes HID, SWD and SWN may also be applied to the applicable branch circuit breakers
shown above, except suffix SWN may NOT be applied in combination with LC main circuit
shown above, except suffix SWN may NOT be applied in combination with LC main circuit
breakers.
Where QO (B) circuit breakers are shown above, QO (B) H, QO (B) VH, and QH (B) circuit - Where QO (B) circuit breake

- For shown circuit breakers rated less than this maximum voltage, the indicated short circuit Current rating also applies, but at the voltage rating of the circuit breaker.
Only 15-30 A circuit breakers may be used when the LC circuit breaker is rated 450, 500 or 600 A .
Circuit breakers may not be used when the LC circuit breaker is rated 450,500 or 600 A .
$\triangle$ Obsolescent. Contact your nearest Square $\mathrm{D} /$ Schneider Electric sales office for replacemen circuit breaker. One-pole FJ circuit breakers are still available.
Where $Q O(B)$ GFI circuit breakers are shown above, QO(B), EPD circuit breakers may also be used.


## NF Series Ratings

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|  |  | Main Type | Branch Type | Poles |
| :---: | :---: | :---: | :---: | :---: |
| 240 | 65,000 | EG, FH, FGf , KH, LH, MH, MX, HG, JG | EDB, EDB-EPD | 1,2 \& 3 |
|  |  | EG | ECB-G3 |  |
|  | 100,000 | EJ, FC, FJf , KC, LC, LX, HJ, JJ | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB } \end{aligned}$ |  |
|  |  | EJ, FC, KC, HJ, JJ | ECB-G3 |  |
|  | 125,000 | HL, JL | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, ECB-G3 } \end{aligned}$ |  |
|  | 200,000 | FI, KI, LI, LXI | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ |  |
|  |  | FI, KI | ECB-G3 |  |
| 480Y/277 | 35,000 | EG, FGf , KH, LH, HG, JG | EDB, EDB-EPD | 1,2 \& 3 |
|  |  | EG, HG, JG | ECB-G3 |  |
|  | 65,000 | EJ, FC, FJf , KC, LC, LX, HJ, JJ | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB } \end{aligned}$ |  |
|  |  | EJ, FC, KC, HJ, JJ | ECB-G3 |  |
|  | 100,000 | HL,JL | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB } \end{aligned}$ |  |
|  | 200,000 | FI, KI, LI, LXI | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ |  |
|  |  | FI, KI | ECB-G3 |  |
| 600Y/347 | 18,000 | HG, JG, MG | EDB, EDB-EPD | 1, 2, 3 |
|  | 25,000 | EJ, FI, KH, KL, LC,. LE, LX, LI, LXI, HJ, JJ | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB } \end{aligned}$ |  |
|  |  | LH | EDB(15-70 A), EGB |  |
|  | 35,000 | LC, LE | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ |  |
|  | 50,000 | HL, JL | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB } \end{aligned}$ |  |
|  | 65,000 | FI, KI | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ |  |
|  |  | LI, XI | EJB |  |
|  |  | Remote Main Fuse |  |  |
| 240 | 200,000 | 200 Ampere Maximum Class J or T (600V) | ECB-G3 | 1, 2 \& 3 |
| 480Y/277 | 100,000 | 400 Ampere Maximum Class J or T (600V) | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ | 1,2 \& 3 |
|  | 200,000 | 200 Ampere Maximum Class J or T (600V) | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ |  |
|  | 200,000 | 200 Ampere Maximum Class J or T (600V) | ECB-G3 |  |
| 600Y/347 | 200,000 | 200 Ampere Maximum Class J or T (600V) | $\begin{aligned} & \text { EDB, EDB-EPD, } \\ & \text { EGB, EJB } \end{aligned}$ | 1,2 \& 3 |

(QOBPLxxx-5393 = BMB series Bolt-on, Motorized. (REMOTELY OPERATED) $-\mathbf{x} x x=$ poles. $x \mathbf{x x}=$ trip current. -5393 suffix denotes special 60" control wires. [1 pole] BMB-15, BMB-20, BMB-30
[2 pole] BMB-215, BMB-220, BMB-230, BMB-240, BMB-250, BMB-260 [3 pole] BMB-315, BMB-320, BMB-330
QOPLxxx-5393 = MB series clip-on, Motorized. (REMOTELY OPERATED) $-\mathbf{x X x}=$ poles. $\times \mathbf{x x}=$ trip current. -5393 suffix denotes special $60^{\prime \prime}$ control wires
[1 pole] MB-15, MB-20, MB-30
[2 pole] MB-215, MB-220, MB-230, MB-240, MB-250, MB-260
[3 pole] MB-315, MB-320, MB-330

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LynTec overprint: 139-0407-02 Series Ratings 10/31/06 For most current version see http://www.lyntec.com/139-0407_Series_Ratings.pdf © 2006 Schneider Electric

## Typical Panel Planner and Layout Worksheet - As-built door label See (avid at LynTec.com for model specific Panel Planners for submittals

LynTec MSLC 326-xx Modular Sequencing Load Center
(One-Touch, sequential AC power control for Sound \& AV Systems)
Breaker types, sizes, positions and connections

Comments
$\qquad$
by $\quad$ Date
,

Transfer as-built formation to the door abel upon completion.

Keep this sheet for s-built documentation
ailable as PDF download v.lyntec.com/139-0245_MSLC326PInr.pdf

LynTec
MSLC 326-xx
$-x x=$ Maximum number of sequenced breakers. See right side of page for model number explanation.

Modular Sequencing Load Center


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_MSLC326PInr.pa for latest version. cument \# 139-0245-14 MSLC 326 Planner 10/28/06

Each motorized breaker is controlled by a sequencer
MS-12 Sequencer circuit boards
As-built door label example:
Step \#_1a (1a) (\# in parenthesis is suggested breaker connection in sequencer)
Step \#_1 (1a) \#\# in parenthesis is suggested breaker connection in
Bold line around box $\square$ = suggested sequencer board: \#1(Top), \#2 or \#3.
Fill in box to indicate which sequencer board this breaker is connected to.
in left-hand, low voltage cabinet.






Low voltage control Wiring Diagram located inside left cover.
www.lyntec.com/139-0327_SequencerLV_Wiring.pdf

## MS-12 MODULAR SEQUENCER board

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


MSP 341-48 41/20


# 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

$\frac{\text { 8/BMB }}{\substack{\text { BMB } \\ \text { Bolt-on } \\ \text { Motorized } \\ \text { breakers }}} \underset{\sim}{\substack{\text { BUMB }=\text { Bolt-on } \\ \text { or } \\ \text { UMB }=\text { Clip-on }}}$ breakers
or
MB
Clip-on Motorized breakers

$$
\begin{aligned}
& \text { Load Center - Panelboard } \\
& \text { What's the difference? } \\
& \text { Panelboards are the electrician's } \\
& \text { choice because they have over 250\% } \\
& \text { more wiring space. Panelboards are } \\
& \text { used when bolton breakers, 200\% } \\
& \text { neutrals or high circuit counts with } \\
& \text { heavy isolated technical ground } \\
& \text { wires are required. } \\
& \text { Load Centers are typically used } \\
& \text { where the circuit count isn't high. } \\
& \text { They offer the lowest cost. }
\end{aligned}
$$

## Small 3 Phase Load Center

The standard MSLC 326-xx has a bracketretained, 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]
125A .... -MQD3125 (36 kVA transformer)
150A ..... -MQD3150 (45 kVA)
175A ..... -MQD3175 (50 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.
2 30A \& 35A: 10kAIR
+50A up: 22kAIR (Amps Interrupt Rating) 2 30A .......-M3030 (7.5 kVA transformer) - 35A .......-M3035 (10 kVA)

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. $-\mathbf{x}$ 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

## +50A .......-M3050 (15 kVA) <br> + 70A .......-M3070 (20 kVA) <br> $+90 \mathrm{~A} . . . . . .-$ M3090 (25 kVA) <br> +100 A .....-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 ). 65 k 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 30 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.

2 30A ......-BM3030 (7.5 kVA transformer)
. 35A ......-BM3035 (10 kVA)
$+50 \mathrm{~A} . . . .$. -BM3050 (15 kVA)
$+70 \mathrm{~A} . . . . .-$-BM3070 (20 kVA)

+ 90A ......-BM3090 (25 kVA) + 100A ....-BM3100 (30 kVA)
- 30A \& 35A: 10kAIR
+50 A 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 or MSPH 141 have the following main breaker options: MSP 141 -MQD2xxx series - 25k AIR MSPH 141 -MQG2xxx series - 65k AIR
Ratings available: 70A, 80A, 90A, 100A, 125A, 150A, 175A, 200A or 225A.


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 - $\mathbf{3 0}$ 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, $\mathbf{- 2 0}$ or $\mathbf{- 3 0}$ are Clip-on, 10, 15, 20 or 30 amp single pole.
Square D Q0110, QO115HM, QO120HM or QO130. 15s \& 20s are High Magnetic.

## ACCESGORIES FOR ALL Lintec SECUANC=RS



Circuits 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 1 a and 1 b . Step 2 drives breakers 2 a and 2 b 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.
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 $1 / 4 \mathrm{sec}$. positions set the step rate at $1 / 8$ second. DELAY TIME and DELAY POSITION jumpers and timing
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.

Bold face type = legends printed on MS-12 boards.
One (First) or two (Second) programmable DELAY TIMEs 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
A Kill terminal on each MS-12 board provides an instant shutdown (within 100 milliseconds) when connected to common.
Opening the connection restarts the on sequence as described above.
HurryOff — the Ohh.... no.... switch
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 $6900 \Omega$ (ON) and $4700 \Omega$ (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 12 v @ 10 ma. green LED. The SS-2 switches mount in $5 / 8$ " round holes on $1^{\prime \prime}$ 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 ( 7.5 v rms ) flashed at a $50 \%, 1 \mathrm{~Hz}$ 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 $100 \mathrm{~K} \Omega$.
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 VOUCHERs are used to prove all sequenced receptacles have AC power present. (No circuit breakers are off, all receptacles are live)
Typically, one POWER VOUCHER ${ }^{\text {TM }}$ is plugged into a receptacle for each sequenced circuit and each un-sequenced circuit that must be powered for proper system operation.

The POWER VOUCHER contains an indicator LED and an opto-isolator. The optoisolator's output resistance drops to $\leq 200 \Omega$ when AC line voltage is present.
The POWER VOUCHER output terminals are all connected in series and then back to the last LynTec sequencer's VOUCHER SUPPLY [V+] and VOUCHER SENSE [V-] terminals.
When the ON sequence is completed AND all POWER VOUCHERs are energized from the receptacles, the pilot ON LEDs glow continuously. Any un-energized POWER VOUCHERs will prevent a continuous pilot ON light, indicating to the operator that the system is not ON. Visually scanning all POWER VOUCHERs for a green light will quickly locate the dead circuit.

Jumper the $\mathrm{V}+$ and V - terminals on the last board if power verification is not used.
+5 v Logic Output
A clean logic level output that mimics the ON LED for touch screen drive. Pulses during sequencing, high at end of on sequence. Source: $+3.3 \mathrm{~K} \Omega$ from +5 v .

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 VOUCHERs 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 $24 \mathrm{v}, 40$ 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, $\mathbf{U L} \& \mathbf{U L}_{c}$ 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: $50 / 60 \mathrm{~Hz}, 4$ watts per board with one external ON LED load. 20 watts maximum per panel.

## ARCHITECTS \& ENGINEERS SPECIFICATIONS

ARCHITECT'S and ENGINEER'S SPECIFICATIONS Sound system A.C. power Sequencing Load Center

All A.C. power for the sound system shall be supplied from a time sequenced source capable of being remote controlled from multiple locations.

A means of visual operator feedback shall provide an indication of the progress of the power turnon or turn-off sequence at each control point.

Time between sequence steps shall be adjustable from $1 / 8$ second to 1 second.
Sequencing shall have a time delay adjustable between the low-level equipment circuits and the power amplifier circuits. The delay time shall have a field adjustable range from 1 second to 8 minutes.

The sequencing system shall be capable of shedding the load within 3 seconds after a power failure and automatically re-sequencing when power resumes and remains above 105 volts for more than 5 seconds without operator intervention.

The sequencing system shall have brownout protection; monitoring the line voltage and triggering an automatic shutdown if the line voltage drops below 95 volts for more than 2 seconds.

The sequencing system shall have emergency shutdown capability triggered by external contacts or the sound system operator.

Un-sequenced circuits, as required, shall be supplied from the same A.C. source so that a single lever main circuit breaker is dedicated to the sound system.

All Sequencing Load Centers shall have an isolated technical ground bar.
The sound system power sequencing shall be the LynTec model MSLC xxx series Sequencing Load Center

LynTec - 800-724-4047 - www.lyntec.com

Models:
Single Phase, 22k AIR: MSLC 129-12, MSLC 129-24, MSLC 129-36
Balanced Power, 60v — 0 - 60v, 22k AIR: MSLC 119-12, MSLC 119-24
Three Phase, 22k AIR: MSLC 326-12, MSLC 326-24, MSLC 326-36
Three Phase, 25k AIR: MSLC 341-12, MSLC 341-24, MSLC 341-36, MSLC 341-48
Three Phase, 65k AIR: MSLCH 341-12, MSLCH 341-24, MSLCH 341-36, MSLCH 341-48
This document available in Word format:
http://www.lyntec.com/139-0345_LdCntr_A\&E_Spec.doc
Most recent version pdf
http://www.lyntec.com/139-0345_LdCntr_A\&E_Spec.pdf
139-0345-02_LdCntr_A\&E _Spec 12/23/06

ARCHITECT'S and ENGINEER'S SPECIFICATIONS
Sound system A.C. power Sequencing Panelboard
All A.C. power for the sound system shall be supplied from a time sequenced source capable of being remote controlled from multiple locations.

A means of visual operator feedback shall provide an indication of the progress of the power turn-on or turn-off sequence at each control point.

Time between sequence steps shall be adjustable from $1 / 8$ second to 1 second.
Sequencing shall have a time delay adjustable between the low-level equipment circuits and the power amplifier circuits. The delay time shall have a field adjustable range from 1 second to 8 minutes.

The sequencing system shall be capable of shedding the load within 3 seconds after a power failure and automatically re-sequencing when power resumes and remains above 105 volts for more than 5 seconds without operator intervention.

The sequencing system shall have brownout protection; monitoring the line voltage and triggering an automatic shutdown if the line voltage drops below 95 volts for more than 2 seconds.

The sequencing system shall have emergency shutdown capability triggered by external contacts or the sound system operator.

Un-sequenced circuits, as required, shall be supplied from the same A.C. source so that a single lever main circuit breaker is dedicated to the sound system.

Three phase sequenced panelboards shall have 200\% neutrals.
Single phase sequenced panelboards shall have a single neutral.
All sequenced panelboards shall have a separate and attached isolated technical ground section.
All branch circuit breakers shall be bolt-on.
The sound system power sequencing shall be the LynTec model MSP $x x x$ or MSPH xxx series Sequencing Panelboard.

LynTec - 800-724-4047 - www.lyntec.com
Models:
Single Phase, 65k AIR: MSP 141-12, MSP 141-24, MSP 141-36, MSP 141-48, MSP 141-60
Balanced Power, 60v-0-60v, 65k AIR: MSP 119-12, MSP 119-24
Three Phase, 65k AIR: MSP 341-12, MSP 341-24, MSP 341-36, MSP 341-48, MSP 341-60
This document available in Word format:
http://www.lyntec.com/139-0339_PnIBrd_A\&E_Spec.doc
Most recent version pdf:
http://www.lyntec.com/139-0339_PnIBrd_A\&E_Spec.pdf
139-0339-05_PnIBrd_A\&E _Spec 10/31/06

## LynTec MRTS-12 and MRTS-24 Modular Rain Tight Sequencers

## Sound system AC Power Sequencer for Square D QO Load Centers \& Panelboards Using the new flexible MS-12 Modular Sequencer control boards

The MRTS sequencer provides a solution for contractors needing sound system sequencing using any Square D cabinet that accepts QO circuit breakers.

Consists of a lockable, rain tight, Hoffman UL \& CSA listed cabinet with the proven LynTec MS-12 Modular sequencer boards and power transformer mounted on an iridited aluminum subchassis.

The subchassis allows the interior to be easily removed for rough-in. Just loosen 4 nuts and lift the subchassis to clear the keyhole slots.

The smooth walled cabinet provides full flexibility of field mounting and piping options.
Click green box for board tour
18.25" High - 12.5" Wide - $6.5^{\prime \prime}$ Deep

## AVAILABLE MODELS

MRTS-12 Drives up to 12 motorized breakers
MRTS-24 Drives up to 24 motorized breakers

## What is included

The MRTS-12 or - $\mathbf{2 4}$ includes the UL/CSA listed cabinet, a 10 amp unmotorized breaker (UMB-10) to feed SEQUENCER POWER to the 24 v transformer powering the sequencer board/s. A SEQUENCER POWER label is supplied.
One 27 position isolated ground bar is supplied for the audio technical ground system. (Typically located in the Square D panel supplied by others).
One SS-2 Switch Set.
The SS-2PL Locking Switch Plate is optional.
Additional LynTec components required
MB-15, MB-20 or MB-30 Branch Motorized circuit Breakers - one per sequenced circuit. (Square d oopllix.-5393) For Bolt-on breakers order BMB-15, BMB-20 or BMB-30.


120 v to $24 \mathrm{v} ., 40 \mathrm{VA}$ transformer (UL \& CSA listed. Impedance protected)
Connect 120 volt primary to supplied 10 Amp. unmotorized

Attach supplied label SEQUENCER POWER


See AllPanel.pdf brochure for sequencer technical specifications.

SQUARE D QO series load center or panelboard supplied by others

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\author{

## www.LynTec.com

 <br> 8401 Melrose Drive, Lenexa, KS 66214 Voice 800-724-4047 • Int'I 913-529-2233 Fax 888-722-4157 • Int'l 913-529-4157}

Overlay
button images and alternate with alternate with
+5 v Logic

Download jpeg button images

Timing Diagram is shown for a one board system with only one jumper in the First $2 \mathbf{s e c}$. position. Step rates default at 1 sec All boards within each panel are factory daisy-chain connected with 4 pin board-to-board cascade connectors.

Remove cascade connectors to separate into multiple systems.
TIMING and LOGIC LEVEL DIAGRAM

## LynTec MS-12 series Modular Sequencer

BUSY


Switch. $\rightarrow \underset{500 \mathrm{msec} \text {. maximum }}{30 \mathrm{msc} \text {. minimum }}$ Source resistance is 3720 to 6900 Ohms depending on model.
For daisy-chain, connect to previous board's CARRY.
Use only the first ON switch in daisy-chained systems - turn ON first board - turn OFF last board.
Switch. Fordaisy-chain, connect to next board's BORROW.
(An output. Connected to next board's HOLD. Low holds next sequencer until this board's on sequence is complete).

(An output. Connect to all external ON switch LEDs).
For daisy-chained systems all ON LEDs + connect to the first board's PILOT.
Power Verification and sequencing completion uses each subsequent board's PILOT output.
The last sequencer uses a $V+$ to $V$ - jumper or series connected Power Vouchers to light the ON LED at end of sequence.


CARRY 1 +35v supplied from next 0N. Source resistance is 3720 to 6900 Ohms depending on model.

BORROW
(An open collector NPN output with an 82 Ohm transient current limiting resistor
Connect to previous OFF. Toggles previous board off).

# QO-PL (Plug-on), QOB-PL (Bolt-on) Powerlink ${ }^{\circledR}$ Remotely Operated Circuit Breakers <br> (Use in Type QO Load Centers and Type NQO, NQOB, and NQOD Panelboards) 

Retain for future use.

## REQUIREMENTS

## Remotely Operated Circuit Requirements

## ! DANGER

HAZARD OF ELECTRIC SHOCK, BURN, OR EXPLOSION.

When servicing a branch circuit fed by a remotely operated circuit breaker, move handle of remotely operated circuit breaker to OFF position. Do not rely on remote operation to open circuit breaker.

Failure to follow these instructions will result in personal injury or death.

## CIRCUIT BREAKER INSTALLATION

## DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must be installed and serviced only by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.

Failure to follow these instructions will result in death, or serious injury.

## See page 2 for LynTec part number explanation

POWERLINK ${ }^{\circledR}$ QO(B)-PL Remotely Operated Circuit Breakers require a power supply capable of delivering at least two amperes at 24 Vdc for a minimum of 50 milliseconds. One-, two-, and three-pole circuit breakers all have one internal motor, and power requirements are the same regardless of the number of poles and ampere ratings.

The required power supply ampacity and control device contact rating are determined by the number of circuit breakers to be switched simultaneously (i.e., four circuit breakers switched simultaneously require a power supply and a control device contact rated 8 amperes minimum). The control device may be either a normally-open (NO)/ normally-closed (NC) contact; a single-pole, double-throw switch (SPDT); or other three-wire control device.

1. Turn off all power supplying this equipment before working on or inside equipment.
2. Before installing circuit breaker turn circuit breaker handle to OFF position.

All LynTec supplied breakers have special 60" control wires. (Square D standards are 18".) figure below)

4. Except for remotely operated connections, QO(B)-PL remotely operated circuit breakers are installed in a panelboard/load center the same as conventional $\mathrm{QO}(\mathrm{B})$ circuit breakers.

Connection of remotely operated circuit (refer to the figure on next page)
5. Assure that power supply and control device meet requirements listed under "Remotely Operated Circuit Requirements."

## CIRCUIT BREAKER INSTALLATION

## CAUTION

## HAZARD OF CIRCUIT BREAKER DAMAGE.

Connect the 24 Vdc remote control wiring as shown on this page.

## Failure to follow these instructions can permanently damage the remotely operated circuit breaker.

```
    LynTec
            part numbers
    MB series motorized circuit breakers (Snap-On)
    May be used in LCLC, LCP, MSLC, MSP, SLC or SP series panels.
    BMB series motorized circuit breakers (Bolt-On)
                Use only in LCP, MSP or SP Panelboards
    All BMB & MB series breakers have Square D part number suffix of
    -5393 indicating a special }60\mathrm{ inch lead length for remote control wires
    required to connect to LynTec control boards in low voltage cabinet.
                    ** = Stocked items
        **MB-15 = 15 Amp. Square D QO-115PL-5393
        **BMB-15 = 15 Amp. square D Qob-115PL-5393
        **MB-20 = 20 Amp. Square D QO-1200L-5393
        **BMB-20 = 20 Amp. square D QOB-120PL-5393
        **MB-30 = 30 Amp. Square D QO-130PL-5393
        **BMB-30 = 30 Amp. Square D QOB-130PL-5393
        Two pole motorized - call for pricing & delivery
        MB-215 = 15 Amp. Square D QO-2 15PL-5393
        BMB-215 = 15 Amp. Square D QOB-215PL-5393
        **MB-220 = 20 Amp. square D Qo-220PL-5393
        **BMB-220 = 20 Amp. square D QOB-220PL-5393
            MB-230 = 30 Amp. Square DQo-230PL-5393
            BMB-230 = 30 Amp. Square D QOB-230PL-5393
40A,50A or 60A, Two pole also available on Special Order
            Three pole motorized - call for pricing & delivery
        MB-315 = 15 Amp. Square D QO-315PL-5393
            BMB-315 = 15 Amp. square D QOB-315PL-5393
        MB-320 = 20 Amp. square D Qo-320PL-5393
        BMB-320 = 20 Amp. Square D QOB-320PL-5393
        MB-330 = 30 Amp. Square D Q0-330PL-5393
        BMB-330 = 30 Amp. square D QOB-330PL-5393
    LynTec also stocks UMB & BUMB (un-motorized) QO series circuit breakers including HM
    (High Magnetic). Recommended for eliminating nuisance trips in high inrush applications.
        [All BMB & MB-x15's and BMB & MB-x20's are HM breakers.]
            800-724-4047
            LynTec ! www.LynTec.com
            8401 Melrose Dr., Lenexa, KS 66214, USA
    Voice 913-529-2233 - Fax 888-722-4157 or 913-529-4157
            LynTec overprint 139-0216-08.2 9/23/06
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            Square D Company
            3700 Sixth Street SW
            Cedar Rapids IA 52404 USA
            1-888-SquareD (1-888-778-2733)
            www.SquareD.com
    6. All wiring and splicing must comply with applicable code requirements for Class 1 circuits. Refer to paragraph 373-8 and article 725 of the National Electrical Code.
7. Three \#18 AWG control wires are attached to the remotely operated circuit breaker for connection to the power supply and remote control device and should be cut to the required length to reach the splice connections. Use \#18 AWG or larger conductors with 600 V insulation and approved wire connectors for splices.
8. Connect the black lead of the remotely operated circuit breaker to the negative (-) terminal of the 24 Vdc power supply. Connect the red lead of the remotely operated circuit breaker to the positive (+) terminal of the 24 Vdc power supply. Connect the white lead of the remote control device. The remote control device provides connections between either positive or negative potential of the power supply and the white wire of the remotely operated circuit breaker, as appropriate.
9. Applying the positive potential of the power supply to the white wire (contact closure between the red wire and white wire) will operate the remote mechanism of the circuit breaker to the OFF position. Applying the negative potential of the power supply to the white wire (contact closure between the black wire and the white wire) will operate the remote mechanism of the circuit breaker to the ON position. A control circuit utilizing a normally open (NO)/normally closed (NC) contact is illustrated below.

NOTE: The remote mechanism will not move the circuit breaker handle. Also, the remote mechanism cannot turn power ON when the circuit breaker is tripped (VISI-TRIP ${ }^{\circledR}$ flag indicator showing) or when the circuit breaker handle is in the OFF position.

## Installation of the trim and operational checks

10. Remove corresponding twist-out from panelboard trim and replace trim.
11. Turn power to panelboard on.
12. Turn remotely operated circuit breaker handle to the ON position.
13. Turn power to the remotely operated circuit on and test this circuit, turning remotely operated circuit breaker off remotely, then on remotely. If power to remote controlled circuit breaker load does not switch off and on, turn off power to remotely operated circuit and panelboard and check wiring.

NOTE: A power supply is available from Square D Company, Cat. No. QOPLPS (plug-on) or QOBPLPS (bolt-on).

Splice not normally required with


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## Emergency circuit breaker activation

for

## MSLC or MSP systems using

 motorized circuit breakers.

## OR

for all systems using motorized circuit breakers.


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Emergency RR7 relay activation for LCRP or PDS-8 series


## LIMITED WARRANTY

All LynTec manufactured products are warranted to be free from defects in workmanship and materials for a period of 5 years from the original invoice date. This warranty shall be limited to the repair, adjustment and/or replacement of defective parts.

LynTec will repair or replace defective LynTec products only at the factory at 8401 Melrose, Lenexa, KS 66214, U.S.A. 800-724-4047. All returns are to be prepaid. LynTec will pay return UPS surface freight charges within the continental United States on warranty repairs. All customs expenses and excess transportation charges will be borne by the customer.

All Square D and General Electric products that are resold as part of a LynTec equipment package are warranted to be free from defects in workmanship and materials for a period of 15 months from the original invoice date. This warranty shall be limited to the repair, adjustment and/or replacement of defective parts.

LynTec will not be responsible for inconveniences or consequential damages occasioned by LynTec equipment, or by breach of any express or implied warranty with respect thereto.

Implied warranties on this product shall be in effect only for the duration of the express warranty set forth above. After the warranty expiration date shown on the serial number label, there shall be no warranties, express or implied on the product.

This warranty becomes void if the product shows evidence of mishandling, tampering, battery or chemical corrosion, fire, water or lightning damage or other acts of nature, use contrary to the applicable instruction manual, shipping damage or repair performed by others.

## Return to Table of Contents

Job List
A partial list of users and their applications of the LynTec AC power sequencing systems
Supplying reliable sequencing solutions to mission-critical venues since 1989
LDS Assembly Hall - Salt Lake City, Utah - Full sound system AC control of 21,000 seat auditorium.
National Cathedral - Washington, D.C. - Full sound system AC control.
Autzen Stadium - Home of Oregon Ducks -Eugene Oregon - 54,000 seat football stadium - Full sound system AC control. NCAA Hall of Champions - Indianapolis, Indiana - Full AV system AC control.
Kentucky Speedway - Sparta, Kentucky - Full sound system AC control.
Gillette Stadium - Foxborough, MA - Home of the New England Patriots - Full sound system AC control.
Madison Square Garden - New York, New York - Full sound system AC control.
Kennedy Center - Washington, D.C. - AC control of Opera House and Concert Hall sound systems.
PNC Park - Home of the Pittsburgh Pirates - Full sound system AC control.
Sun Theater - Anaheim, California - Full sound system AC control.
Breslin Center Arena \& Spartan Stadium - Michigan State - East Lansing, Michigan - Full sound system AC control.
Benaroya Concert Hall - Seattle, Washington - Full sound system AC control, balanced power system.
Tennessee Titans Stadium - Nashville, Tennessee - Full sound system AC control
War Memorial Opera House - San Francisco, California - Full sound system AC control.
SBC Center- Home of San Antonio Spurs- San Antonio, TX - 18,500 seat arena - Full sound system AC control.
Jordan Hare Stadium - Auburn University, Alabama - 85,214 seat football stadium - Full sound system AC control.
Lookingglass Theatre \& Millenium Park - Chicago, Illinois - Full sound system AC control.
Alltel Stadium - Home of Jacksonville Jaguars - Jacksonville, Florida - Full sound system AC control.
Memorial Stadium - Home of Nebraska Cornhuskers - Lincoln, Nebraska - Full sound system AC control.
Quad Discovery Center, Smithsonian - Washington, D.C. - Sound system AC control.
Dale Halton Arena - University of North Carolina, Charlotte - Charlotte, North Carolina - Full sound system AC control.
New England Conservatory of Music - Boston, Massachusetts - Full sound system AC control.
Galveston Convention Center - Galveston, TX — Full sound system AC control.
Ralph Wilson Stadium - Home of the Buffalo Bills - Buffalo, New York - Sound system AC control.
Creative \& Performing Arts High School - Philadelphia, Pennsylvania - Full sound system AC control.
University of Georgia Coliseum - Athens, Georgia - 10,000 seat multipurpose arena - Full sound system AC control.
Fremont Street Experience - Las Vegas, Nevada - Sequential control of $80-6,000$ watt power amplifiers.
Popejoy Hall Performing Arts Facility — University of New Mexico - Full sound system AC control.
Shakespeare Theatre -Chicago, Illinois -Full sound system AC power control.
Conte Forum Arena, Boston College - Boston, Massachusetts - Full sound system AC control.
Vivian Beaumont Theater - Lincoln Center - New York, New York - Full sound system AC control.
Network Associates Coliseum - Home of Oakland Raiders - Oakland, California - Full sound system AC control.
Dollywood - Pigeon Forge, Tennessee - Full sound system AC control.
Texas Instruments Boardroom - Dallas, Texas - Full sound system AC control.
Circle Center Mall at Artsgarden - Indianapolis, Indiana - Full sound system AC control.
Baum Stadium at George Cole Field —University of Arkansas - Fayetteville, Arkansas - Full sound system AC control.
Westlake Ohio City Hall - Westlake, Ohio - Full sound system AC control.
High Street Baptist Church - Springfield, Missouri - Full sound system AC control.
Hugh Hodgson Concert Hall —University of Georgia - Athens, Georgia - Full sound system AC control.
Schubert Theater - Boston, Massachusetts - Full sound system AC control.
World Changers Church - Atlanta, Georgia - Full sound system AC control.
Germain Ampitheater - Columbus, Ohio - Full sound system AC control.
Madam Tussauds Wax Museum - Las Vegas, Nevada - Full sound system AC control.
Roxy Roller Disco - New York, New York - Full sound system AC control.
Qualcom Stadium - Home of San Diego Chargers - San Diego, California - Full sound system AC control.
"The Groove" Dance Club - Universal City Walk, Orlando, Florida - Full sound system AC control.
St. James Church - Madison Avenue, New York City — Full sound system AC control.
Lancaster Municipal Stadium - Home of the Lancaster Jethawks - Lancaster, California - Full sound system AC control.
Mission Planning Center - MacDill AFB - Tampa, FL — Full sound system AC control.
Starlight Theater - 12,000 seat ampitheater - Kansas City, Missouri - Full sound system AC control.
Cleveland Browns Stadium \& Gund Arena, Home of Cleveland Cavaliers - Cleveland, Ohio - Full sound system AC control.

## Sequencing APPLICATION NOTE Index

Document \#
These sequencing system Application Notes are available as PDFs

## 139-0266

Touch-Screen control - Timing diagram
For AMX or Crestron touch-screen control of Modular sequencing systems. Virtual ON \& OFF screen images.
139-0270- Stadium + Club
A typical three panel, daisy-chained, system with two locking control locations. An additional independent CLUB panel sequences separately or with the MAIN system.

## 139-0271- Remote RR7 Latching relays for MS-12 Modular Sequencer

Remote front-end control of two RR7 power relays from LynTec Modular Sequencer.
139-0272- Auxiliary Modular Control
Auxiliary control of motorized breakers 1A, 1B, 2A \& 2B.
139-0277- Series-Parallel Hookup - or — PDS-8 \& MSLC/MSP Parallel Hookup
A five panel, series-parallel system with two locking control locations for faster sequencing - or - Parallel connection of PDS-8 series \& MS series systems
139-0284- Motorized Breaker remote wire sizing
Wire sizing tables for remotely mounted motorized breakers.
139-0292- Shared Theatre Sequencers
Allows a single front end to be used for either a BLACK BOX or main theatre.
139-0293- Arena 2 mode sequencer
Provides separate control of power amplifiers feeding the upper seating in an arena.
139-0304- Extra 2 or 4 circuits
Two separate sound systems. Main room has 26 circuits. Room 2 has 10 circuits.
139-0309- Custom Switch Legend Film
Field print custom switch legends on Laser Trans parency film or paper.

## 139-0316- Opera House 2 mode sequencer

Provides separate control of power amplifiers.
When the Opera House is in normal use the house power amps are used. It is desirable to turn off the power amps, leaving the Front End on during pre-show production work or when touring shows provide their own systems.
Reduces power amplifier wear and tear and minimizes wasted power.

## 139-0317- Phase Leg Protection

Protecting Sound Systems from POPS caused by Phase Leg and Partial System power failures.
139-0319- Auditorium 3 mode sequencer
Provides 3 scenarios for Auditorium sound system AC power control.
139-0323- Dual Booth System
Dual booth club sound system.
139-0335- Function reversal - sound off / work lights on
Reversing sequencing action to turn on work lights when sound system is turned off.
139-0356- AUTOMIX - MAIN power sequencer with 3 control positions
A two function system using either a STAGE AUTOMIX or the full MAIN system with 3 control positions.

## 139-0360- AUTOMIX - MAIN power sequencer with 2 control positions <br> A two function system using either a STAGE AUTOMIX or the full MAIN system.

139-0404- Front Of House - Lecture, 2 function sequencer
A two function system using either a full FOH or a Lecture front end.

## 139-0436- Two separate room power sequencers share a DSP

Separate rooms share a DSP with off lockout to guarantee DSP power control for either / or both situations.
139-0445- UPS Control for Modular Sequencers using CR option
Provides sequencer control for turn off of UPS powered devices when the system is shut off to prevent UPS discharge.
Your application different? - We'll be glad to help, just ask for Applications Engineering.


[^0]:    A Not available in HD and HG two-pole rating (2-pole module)
    2-pole in a 3-pole module.
    12/01/05

[^1]:    QOBxxx (B) = BUMB series Bolt-on, UnMotorized Breaker $-\mathbf{x} \times \mathrm{X}=$ poles. $\mathrm{x} \mathbf{x x}=$ trip current
    [1 pole] BUMB-15, BUMB-20, BUMB-30
    [2 pole] BUMB-215, BUMB-220, BUMB-230 [3 pole] BUMB-315, BUMB-320, BUMB-330
    QOxxx = UMB series clip-on, UnMotorized Breaker $\mathbf{x} x x=$ poles. $x \mathbf{x x}=$ trip current
    [1 pole] UMB-15, UMB-20, UMB-30
    [ pole] UMB-215, UMB-220, UMB-230
    [3 pole] UMB-315, UMB-320, UMB-330
    All 15 \& 20 A breakers are HM (High Magnetic)

