EC90 SUPERVISOR™

Modular digital dimming with Reporter™ option

EC90 Supervisor™ is a high-specification dimming system that incorporates advanced electronic and mechanical design concepts to meet the most demanding requirements. All dimmer modules are available with Reporter™ functions, enabling load characteristics to be measured and reported to a remote PC. EC90 Supervisor dimmer racks are available configured to an exact specification from components described below, or with a standard complement of dimming modules as listed.

- Plug-in modular digital dimming system for mid to high specification applications
- Two rack sizes: Large - with up to 72 x 3kW, 36 x 6kW or 18 x 10kW dimmers per rack; Small - with 36 x 3kW, 18 x 6kW, 9 x 10kW dimmers per rack
- Dual electronics option for full redundant tracking backup with selectable auto-switchover
- 4 levels of dimmer performance are available: Standard, Standard with Status Reporting, High-specification, and High-specification with Status Reporting
- 3kW contactor module options to switch motors, HMI ballasts and other non-dimmable equipment
- Status Reporting modules (including contactors) detect: No load, Overload, Over temperature, Excess DC, Internal fault, MCB trip, Thyristor short circuit, Load profile errors, live status reporting of RMS output voltage and current, module temperature and DC output voltage, per dimmer

General specifications

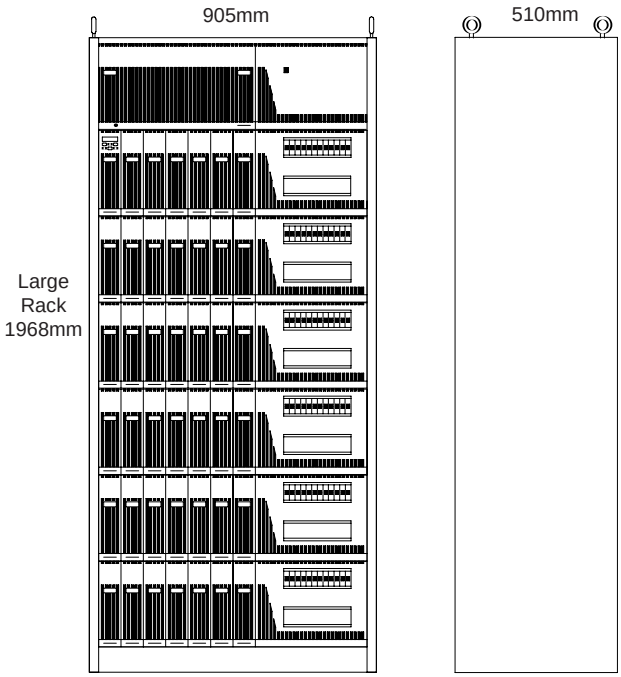
Rack

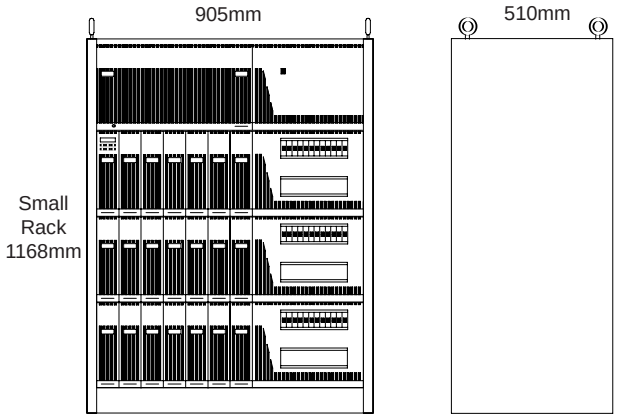
Large takes 6 crates (36 single-width modules).Small takes 3 crates (18 modules). Welded steel construction finished in dark grey (BS4800 “Storm Grey”) powder paint.Over temperature warning on rack, remote console or PC.Phase OK neon indicators provided.

Rack dimensions and weights

	Large rack	Small rack
Height	1964mm	1162mm
Width	910mm	910mm
Depth	510mm	510mm
Weight (full)		
Standard Modules	310kg	185kg
High spec. Modules	370kg	215kg
Weight (empty)	205kg	135kg

- Reporting modules, including non-dims, can detect a load change, down to 10% of the dimmer's power rating, detecting failure of an individual element of a paralleled load
- Reporting modules may perform Load Cable Compensation, using the programmed cable resistance (per circuit) and load characteristic to continuously compensate for voltage drop
- Racks may contain a mixture of dimmer types including reporting and non-reporting
- Load status reporting to PC using the Reporter™ PC software
- "Panic" function, to bring selected dimmers to full, operational without processor and can be actuated manually or automatically (e.g. by a fire alarm system)
- Precision line voltage regulation to minimise output changes when the supply voltage fluctuates
- Two opto-isolated Mux inputs with individual patches provided as standard
- DMX 512, SMX, AMX 192 and D54 control protocols supported
- Up to 32 analogue +/- 10V inputs per rack, patchable to any dimmer
- 99 System Wide Control, SWC™ memories for additional preset and backup use, using simple "snapshot" recording
- Direct circuit and preset control by hand-held System Wide Control (SWC™) programmer with specialised riggers functions
- 16 room (zone) by 8 preset Outlook™ architectural lighting control for auditorium, front of house and other "zoned" uses
- Library of 6 fixed and 5 downloadable dimmer curves, programmable per dimmer
- 16 bit digital fade processing to ensure smooth fades with 8 bit protocol
- LED Outputs for remote Overtemp/Fan fail, Panic and Active processor (dual systems)
- 12 independent fully programmable +10V analogue signal outputs (large processor only)
- Complies with all mandatory European safety and EMC regulations





EC90 Supervisor racks

Two sizes available - large for 6 crates; small for 3 crates. The maximum capacity of a small rack is 36 x 3kW, or 18 x 6kW or 9x10kW. Large racks can accommodate a maximum of 72 x 3kW, or 36 x 6kW or 18 x10kW. Crate types can be mixed in any rack, and there is top and bottom cable access.

EC90 Supervisor crates

Crates are available for six dual 3kW modules or six single 6kW modules or 3x10kW. Each crate version is available with Single Pole, Single Pole (Neutral Disconnect) or Double Pole protection.

EC90 Supervisor modules

Dimmer modules are available in five module categories: dual 3kW Economy dimmers; dual 3kW Hi-Spec dimmers; single 6kW Hi-Spec dimmers; 3kW Hi-Spec dimmer/contactor modules and double width 10kW dimmers. All dimmer and contactor modules are available in standard or Reporter™ versions.

3kW Dimmer module

Economy module with two 3kW firm-fired thyristor dimmers and standard filtering.

3kW High specification dimmer module

High specification module with two 3kW hard-fired thyristor dimmers and Broadcast TV-standard filtering.

6kW High specification dimmer module

High specification module with a single 6kW hard-fired thyristor dimmer and Broadcast TV-standard filtering.

10kW High specification dimmer module

High specification module with a single 10kW hard-fired thyristor dimmer and Broadcast TV-standard filtering.

Hybrid contactor modules

Three modules which offer dual contactor, dimmer/contactor or contactor/dimmer (left/right positions) versions. Both dimmers and contactors are rated at 3kW, and the dimmers are hard-fired thyristors with Broadcast-standard filtering.

EC90 Supervisor and Reporter™ functions

All versions of EC90 Supervisor module can be supplied as standard or with Reporter features which operate with a remote PC.

Standard Supervisor functionality from a remote PC includes:

- Dimmer setup functions (library and user programmable curves, max/min outputs, dimmer response times, etc.)
- Patch setup for Mux A, Mux B and analogue inputs
- Direct dimmer and preset control
- Rack fan fail warning
- MUX failure A, B
- Master/Backup active or tracking

Additional Reporter Features Include

- Memorised load per dimmer
- Warning if load deviates from memorised value
- No load
- Dimmer fault
- Breaker trip: thyristor (or contactor) short circuit plus thyristor (or contactor) open circuit
- No control of dimmer.
- Excess DC voltage output.
- Overheat per dimmer.
- Overload current per dimmer.

Mechanical

Installation

Racks designed for adjacent mounting or back to back (front access only required).Racks can be bolted to floor. Module removal requires use of a tool.

Ventilation

Max ambient temperature 40°C.Dual tangentile cooling fans. A single fan failure forces the second fan to full. Variable or continuous fan speed control for minimum acoustic noise, and maximum fan-life.

Electrical

Rack power input

220V to 240V 3 phase, neutral + earth TNS 600A per phase maximum, 50Hz/60Hz.

Bus bars

Bus bars rated at 50kA fault current

Standard load

10mm2 for 3kW, 16mm2 for 6kW, and 25mm2 for 10kW Wire Terminal Size dimmers

Phasing

Single phase by strapping busbars, with max. current 600A per rack.
3-phase Delta to special order.
Crates are normally 3-phase, Single phase available to special order.
Most requirements for custom dimmer phasing are possible to special order.

Standards

Conforms to all mandatory European safety and EMC standards, including EN60950, EN50081, EN50082. All High Specification modules comply with BBC noise specifications PID/171.

Protection

A rack can be supplied with most power and protection combinations including RCD's on most crates. Provision for optional 4-pole rack isolator.

Control logic

All or individual dimmers may be programmed to conform to a selection of control logic rules.

Power modules

Type	Firing	Rise Time (10-90%)	Current
Dual 3kW	Firm	100 µs	2 x 16A
Dual 3kW	Hard	450 µs	2 x 16A
6 kW	Hard	450 µs	32A
Double width 10kW	Hard	450 µs	50A
3kW dimmer & contactor	Hard + c	450 µs	2 x 16A
3kW contactor & dimmer	c + Hard	450 µs	2 x 16A
Dual contactor	-	-	2 x 16A

Miscellaneous power modules

Type	Current
Constant	2 x 16 A

Note: Blank modules must be used wherever dimmer modules are not installed to maintain adequate air flow.

Power modules - general

Indicators

All modules have POWER ON and proportional OUTPUT mimic LEDs

Status

Reporting modules have flashing red ERROR LED indicators

Safety

Power modules are class 2, double insulated and fully enclosed to prevent exposure of live parts if a module is removed from the rack. Each module shuts down automatically under an overheat condition

Efficiency

Dimmer power efficiency at least 97% at full load. No-load loss of 3V RMS for standard 3kW dimmers

Non-Dims

Contactors are used for Non-Dims modules - not thyristors.

Interchangability

Modules are keyed preventing wrong type insertion. Any 3kW dimmer (including reporting) can fit in any 3kW crate, any 6kW in 6kW crate etc.

Protection

Each circuit is protected by a MCB with 10,000A fault current rating. MCBs conform to European standard EN60 898 ‘C’ characteristic

Power pevices

Firm Fired (standard) or Hard Fired thyristors (high-specification)DC component of output is normally less than 0.5V

Control electronics specification

General

Processing

Completely digital dimmer processing

Controls

6 button keypad to program all rack functions on processor module
Local switch for single rack PANIC function

Indicators

2 line by 8 character back lit LCD display on processor module

Languages

English, Spanish, French, German

Data port

Connector on rack front for configuration, control and Operating Software upgrades.

Dimmer characteristics

Settings

Set max output voltage, 50V to 250V in 1V steps.
Set min output level, 0 to 100%.
Override dimmer level, 0 to full.

Library curves

Square, S-curve, Linear power output, User programmable curves, Non-Dim trigger level 0 to 99%,

Fluorescent - electronic ballast, Fluorescent - magnetic ballast, 5 user defined curves.

Response time

Fast (30 ms), Normal (100 ms), Slow (300 ms).

Reporting

Dimmer status reporting enabled or disabled (Reporter modules only). Cable resistance in m , for use with Reporting dimmers, and Cable Compensation feature.

Security features

Dual electronics

Redundant tracking backup using an optional second plug-in processor.
Backup processor activated by remote switching or automatically.
Set-up data is automatically transferred between main and backup processors in case of replacement of either processor.

Set-up data storage

Non-volatile storage of set-up data on removable memory pcb
Memory pcb can be moved on exchange of processors.
Set-up data can be saved and restored using the Reporter PC program.

Mux fail options

Hold forever (status quo). User programmable “hold” period before fade to user assigned SWC backup preset.

PANIC function

Any of the 72 or 36 dimmer and 12 analogue outputs (not on the 36 dimmer processor) may be user selected to go fully ON on activation of the rack PANIC switch or an external switch, or failure of the processor if programmed.
Activation is by hardware only - no processor needed.
AUTO PANIC on processor failure (requires optional power supply).
PANIC operation forces cooling fans on at full.

Thermal control

Cooling

All power components fan cooled.
High capacity heat sink in each module.
2 fans for redundancy in case of one fan failure.

Overheat Protection

Fan fail warning on rack, remote console or PC.
Fan fail warning forces cooling fans on at full.
Individual module shutdown.
Reporting modules warn of O/T before module shut down and forces fans to full.

Opto-isolation

Inputs	All digital inputs are opto-isolated to 2,500V RMS: Mux A and Mux B - DMX512, SMX, SWC input, Outlook input, Reporter input, External switch inputs.

Reporter PC

The Reporter PC program is available to run on an IBM compatible desktop or laptop PC.

Function	Minimum PC Specification	Preferred PC Specification
Processor	Intel486DX2®-50	Intel Pentium® Processor
Memory	8 Mb RAM	> 8 Mb RAM
Monitor	VGA 640 x 480 monochrome	SVGA 800 x 600 colour
Operating System	Windows® 3.1	Windows® 3.1, 3.11 or Windows 95®

Control electronics - performance

Dimmer Update Rate	16 ms (60 Hz) or 20 ms (50 Hz).
Response Time to Signal Changes	16 ms (60 Hz) or 20 ms (50 Hz).
Line Regulation	Maintains dimmer output levels to within +/- 1V of set output within the range of the control electronics (200V to 240V nominal), providing that the set level is not higher than the power input voltage less the dimmer voltage loss. Automatically compensates for frequency variations 45 Hz to 62 Hz. Line regulation acts on each individual dimmer and maintains dimmer curve parameters (set curve, max level and min level).
Fade Smoothing	Up to 8 point interpolation between DMX values to smooth console fade steps.

Control electronics - programmable features

Patching	User programmable patches for Mux A and B inputs. User programmable rack start address with following dimmers automatically sequenced. Free format patching - any dimmer to any Mux input and address for total flexibility. User programmable 4-digit ID for sequential numbering of systems larger than 512 circuits. Patch any analogue 10V input to any circuit(s) “Room” to channel to dimmer patch for Outlook architectural control.

Control inputs

Dimmer Control	Mux A: DMX512 or AMX192 or D54 or SMX. Mux B: DMX512 or SMX.
Analogue:	32 inputs, +/- 10V (72 dimmer processor and dual electronics processor). 16 inputs, +/-10V (36 dimmer processor).
Remote Control	Control of Circuits and SWC™ presets using hand held(system-wide)programmer unit. Up to 25 SWC™ 8 or 16 button preset panels to record and playback presets*. Outlook™ 16 room (zone) by 8 preset stations to provide integrated architectural control*. *Outlook and SWC stations require 1 optional power supply per system, located in a rack.
Reporting	Windows® based Reporter™ PC program for remote configuration and status reporting.
Local Control	Rack processor keypad and LCD display with full functionality, (per rack) and optional keypad lock. Switch for rack PANIC control.
RS232 Port for Local PC Control	Rack configuration using the Reporter PC program. Library and backup rack set-up storage on PC, via Reporter PC program. Operating software upgrades via DOS PC program.
External Dry Contacts	Select main or backup processor (dual processor systems) Select mux A or mux B (with appropriate control logic mode) Set or Reset PANIC SWC preset 1 GO Next SWC preset GO
Control Outputs	Analogue 12 analogue +10V output signals (72-way processor only).
External LED	Processor Active (dual electronics systems only).
Drive Signals	Panic active. Fan Fail/Overtemp (Overtemp for Status Reporting dimmers only).
Electrical	Signal wire termination at one easily accessible point. Signal wire termination on two-part plug-in connectors. Loop-out connectors for daisy chaining signals between racks.
Status LEDs	5V opto isolation power ok. Auxiliary power supply ok. PANIC active. Fan fail/module overtemp (reporting dimmers only).
Presets	99 user programmable SWC presets, plus preset 0 (blackout). Snapshot recording of SWC presets from any remote preset station, hand held programmer or Reporter program. Individual SWC preset crossfade time recording. One user assignable SWC backup preset on loss of both Mux inputs 16 rooms (independent zones), each with 8 Outlook presets, plus on/off, per room.

Ordering information

EC90 Supervisor 72 x 3kW

Standard configuration large rack with 36 dual 3kW dimmer modules. Racks available with standard specification or high specification modules, and with or without Reporter™ options (see general details). Racks also may be configured to special order.

Cat. No.	Description
74461	EC90SV, 72 x 3kW, standard, Reporting
74462	EC90SV, 72 x 3kW, standard
74471	EC90SV, 72 x 3kW, hi-spec, Reporting
74472	EC90SV, 72 x 3kW, hi-spec

EC90 Supervisor 36 x 3kW

Standard configuration small rack with 18 dual 3kW dimmer modules. Racks available with standard specification or high specification modules, and with or without Reporter™ options (see general details). Racks also may be configured to special order.

Cat. No.	Description
74463	EC90SV, 36 x 3kW, standard, Reporting
74464	EC90SV, 36 x 3kW, standard
74473	EC90SV, 36 x 3kW, hi-spec, Reporting
74474	EC90SV, 36 x 3kW, hi-spec

EC90 Supervisor 36 x 6kW

Standard configuration large rack with 36 single 6kW dimmer modules. Racks include high specification modules, with or without Reporter™ options (see general details). Racks also may be configured to special order.

Cat. No.	Description
74481	EC90SV, 36 x 6kW, hi-spec, Reporting
74482	EC90SV, 36 x 6kW, hi-spec

EC90 Supervisor 18 x 6kW

Standard configuration small rack with 18 single 6kW dimmer modules. Racks include high specification modules, with or without Reporter™ options (see general details). Racks also may be configured to special order.

Cat. No.	Description
74483	EC90SV, 18 x 6kW, hi-spec, Reporting
74484	EC90SV, 18 x 6kW, hi-spec

Strand Lighting Ltd North Hyde House Hayes Rd Heston Middx UB2 5NL UK Tel: +44 (0)181 571 3588 Fax: +44 (0)181 571 3305
Strand Lighting GmbH Ullsteinstrasse 114-142 D-12109 Berlin Germany Tel: +49 (0) 30/70 79 51 0 Fax: +49 (0) 30/70 79 519 9
Strand Lighting Italia srl Via delle Gardenie 33 00040 Pomezia-Roma Italy Tel: +39 06 9147123 Fax: +39 06 9147136
Strand Lighting Asia Ltd 7/F Corporation Square 8 Lam Lok Street Kowloon Bay Hong Kong Tel: +852 2757 3033 Fax: +852 2757 1767