Strand
LIGHTING

Operator's Guide

C21
EC21

Dimmer Rack

Prefix

Thank you for choosing Strand Lighting C21/EC21 series dimmer rack. We trust that the equipment will meet all your dimming needs and will provide you with reliable service for many years.

Strand Lighting can assure you that every effort has been made to ensure that the equipment has been designed to meet the highest professional standards and that dimmer racks and their components have been assembled, inspected, and tested in accordance with our strict quality assurance program.

Should you encounter any problems or difficulties with your dimmer racks, please contact the nearest Strand Lighting service representative. For a complete list of Strand Lighting offices and service centers or visit our Web site (**www.strandlighting.com**).

This manual describes the operation of for C21/EC21 series dimmer racks. A separate Installation Guide provided with the dimmer racks describes how to install the dimmer racks and perform initial setup procedures.

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Definition of Terms

This manual uses the following terms throughout:

channel A device controlling a dimmer or group of dimmers. Historically, there is a physical controller (such as a slider) for each channel. On most current control systems, channels are numbers accessed by a numeric keypad. Each channel can control multiple dimmers.

circuit A connection device and wiring for powering a lighting fixture from a dimmer.

circuit ID A unique four-digit numeric identity which you can assign to each dimmer. The circuit ID may be the same as the dimmer number, or may be a number used to indicate circuit location, phase, channel number, etc. This feature is useful for system wide control functions.

crossfade A fade that contains both an up-fade and a down-fade, or any fade where the levels of one cue are replaced by the levels of another cue.

cue The process of recalling a preset from its memory location and putting the result on stage.

Preset, Memory, and cue are often used interchangeably.

curve The relationship between a control level and the actual dimmer output.

dimmer A device controlling power to a lighting fixture. Two lights on the same dimmer cannot be separately controlled.

default The original factory settings.

DMX512 An ANSI communications protocol standard that describes a method of digital data transmission between controllers, lighting equipment and accessories.

Ethernet A high-speed network based protocol used to transmit data from a lighting controller to a dimmer rack using a single Ethernet cable.

fade A gradual change in stage levels from one set of intensities ("look") to another.

fade time The time it takes for dimmer levels to go from their current levels to the levels in the selected preset, or DMX value. Each preset has its own fade time.

level A numerical value used to express the "brightness" of the load on a dimmer. Usually shown as %.

Outlook A digital architectural control system for use with C21/EC21 dimmer racks.

patch Historically, the process of physically connecting circuits to dimmers. Now usually refers to electronic assignment of dimmers to channels.

phase The three phases of the mains supply to which the dimmers are connected are identified as Line 1, Line 2, Line 3 in 230v markets and as phase A, phase B, and phase C in 120v markets.

power module A chassis containing one, two or four dimmer or contactors. This is sometimes referred to as a "dimmer". However, each C21/EC21 power module can have multiple dimmers or contactors in it, so this manual distinguishes between dimmers (individual power control circuits) and power modules (a collection of one or more power control circuits).

preset	A pre-defined setup of intensities for a set of channels, stored in memory for later replay. For Outlook applications, the C21/EC21 series dimmer rack processor module stores 8 programmable presets per room for up to 16 rooms. For SWC applications, the processor module stores 128 programmable presets. Preset 0 (ZERO) is always a blackout.
Preset fade time	See "Fade Time".
profile	The relationship between a control level and the actual dimmer output. Also known as 'dimmer law' or 'curve'.
rack number	A number used to uniquely identify each dimmer rack in a multiple rack system. Rack numbers are set from the front panel of the rack processor module, and are usually set by the installation engineer.
room	An area separately defined for purposes of architectural lighting control (e.g., Outlook control stations). This is usually a room in the traditional sense (an indoor enclosed area) or a portion of a room that can be partitioned off. Each room may be separately and simultaneously controlled by the system.
RPH	Rack Processor Housing
RPM	Rack Processor Module
SSR	(Solid State relay) A power control device used in Strand dimmers that contains two silicon control rectifiers (SCRs), control circuitry, and optical isolation circuitry.
SWC	(System Wide Control) A method of programming and controlling more than one dimmer rack simultaneously. A hand held controller lets you program and recall 128 presets, and control individual dimmers. 8 and 16 channel pushbutton stations, and an A/V interface let you recall and 8 or 16 of the 128 presets at each station. Please contact Strand Lighting or see the *System Wide Control Data Sheet* or *System Wide Control User's Manual* for details on how SWC works.

Technical Assistance	C21/EC21 racks and dimmers require a minimum of maintenance and servicing.
	For operation or technical assistance, please contact Strand Lighting or the local Authorized Service Center serving your area. (www.strandlighting.com)

Contents

This manual describes the operation and setup of the dimmer rack. It does not contain information about installing the rack. See the separate *C21 (2-450173-010) or the EC21 (2-450173-020) Dimmer Rack Installation Manual* for detailed information concerning installation and wiring of the dimmer rack, then go to *Section 3 - Programming the C21/EC21 Dimmer Rack* starting on page 19 in this manual for initial rack setup and, if necessary, see *Section 4 - Basic Troubleshooting* starting on page 54 of this manual.

Table of Figures

Section 1 - General

Summary Specification

Dimmer Rack Specifications:

Capacity:	Large rack: 48 Dimmer Modules (dual, single or quad) Mid-range rack: 36 Dimmer Modules (dual, single or quad) Small rack: 24 Dimmer Modules (dual, single or quad)
Supply:	90 to 264VAC, 3-phase, neutral + earth (Delta on request), 47 to 63 Hz
Max Current (per phase):	Large rack: 800 amps (120V markets), 600 amps (230V markets) Mid-range rack: 800 amps (120V markets), 600 amps (230V markets) small rack: 800 amps (120V markets), 600 amps (230V markets)
Dimensions:	Large rack: Height 80" (2032mm), Width 24.36" (619mm), Depth, 23.62" (600mm) Mid-range rack: Height 67" (1703mm), Width 24.36" (619mm), Depth, 23.62" (600mm) Small rack: Height 57" (1448mm), Width 24.36" (619mm), Depth, 23.62" (600mm)
Weight:	Large rack: 300 lbs. (136 Kg) empty and 690 lbs. (310 Kg) with all modules and electronics installed. Mid-range rack: 270 lbs. (122Kg) empty and 662 lbs. (300Kg) with all modules and electronics installed Small rack: 240 lbs. (109Kg) empty and 512 lbs. (232Kg) with all modules and electronics installed.
Busbar Rating:	50,000 AIC standard or 100,000 AIC optional
Control Circuit Isolation:	Optical isolation between high voltage and control electronics is 2500VAC. Control inputs are also isolated from the processor at 2500VAC, offering double optical isolation between the controller and high power circuits.
Storage Temp:	-40°C to 70°C
Operating Temp:	0°C to 40°C ambient
Storage Humidity:	0% to 95%, relative humidity, non-condensing
Operating Humidity:	10% to 95%, relative humidity, non-condensing

Note: All specifications are correct at the time of going to press. In the interest of continuous product improvement Strand Lighting reserves the right to change specifications without notice.

Dimmer Modules Specifications:

RCD (GFCI):	Residual Current Device with circuit protection.
Circuit protection:	Appropriately sized fully magnetic or thermal/magnetic circuit breaker of 10,000 AIC (15A, 20A, 50A & 100A @ 120V) or 50,000 AIC (15A, 25A & 50A @ 230V) fault current rating.
Output voltage:	Maximum full load voltage loss measured at the dimmer rack is 3 volts. Maximum output voltage for each dimmer can be limited through a software setting.
Load regulation:	Dimmers will maintain their output within +/- 1% of the set output with load changes from 1kW to the maximum rating of the dimmer.
Line compensation:	The system regulates dimmer outputs to within 1V over operating voltage range. Each dimmer is individually regulated.
Efficiency:	Minimum power efficiency for dimmers is 97% at full load. Maximum full load dimmer loss is 3V RMS. Contactor non-dim power efficiency is 99%.
DC component of output:	Less than 1 volt with tungsten loads from 60W to the maximum rating of the dimmer, at all control levels.
Input response time:	The response time (time between OFF and 100%) can be set to 'Fast' (30msec), 'Medium' (100ms), or 'Slow' (300ms). The default is medium (100ms).

Note: All specifications are correct at the time of going to press. In the interest of continuous product improvement Strand Lighting reserves the right to change specifications without notice.

120V Dimmer Modules

The following dimmer & non-dim modules are currently available for the 120V markets:

Catalog #	Ampacity	Kw	Type	Reporting	Number of Chans	Load	Module Type
76550	10A	1.2kW	Basic	No	Quad	Incan.	2
76551	15A	1.8kW	Basic	No	Dual	Incan.	36
76552	15A	1.8kW	Standard	No	Dual	Incan.	36
76553	15A	1.8kW	Hi Rise	No	Dual	Incan.	36
76554	15A	1.8kW	Constant	No	Dual	Incan.	42
76555	15A	1.8kW	Nondim	No	Dual	Incan.	39
76556	15A	1.8kW	Basic	Yes	Dual	Incan.	15
76556-LED	15A	1.8kW	Basic	Yes	Dual	Incan.	15
76557	15A	1.8kW	Standard	Yes	Dual	Incan.	15
76557-LED	15A	1.8kW	Standard	Yes	Dual	Incan.	15
76558	15A	1.8kW	Hi Rise	Yes	Dual	Incan.	15
76558-LED	15A	1.8kW	Hi Rise	Yes	Dual	Incan.	15
76559	15A	1.8kW	Constant	Yes	Dual	Incan.	42
76560	15A	1.8kW	Nondim	Yes	Dual	Incan.	39
76560-LED	15A	1.8kW	Nondim	Yes	Dual	Incan.	39
76561	15A	1.8kW	Sinewave	Yes	Dual	Incan.	45
76562	20A	2.4kW	Basic	No	Dual	Incan.	53
76563	20A	2.4kW	Standard	No	Dual	Incan.	53
76564	20A	2.4kW	Hi Rise	No	Dual	Incan.	53
76565	20A	2.4kW	Constant	No	Dual	Incan.	59
76566	20A	2.4kW	Nondim	No	Dual	Incan.	56
76567	20A	2.4kW	Basic	Yes	Dual	Incan.	53
76567-LED	20A	2.4kW	Basic	Yes	Dual	Incan.	53
76568	20A	2.4kW	Standard	Yes	Dual	Incan.	53
76568-LED	20A	2.4kW	Standard	Yes	Dual	Incan.	53
76569	20A	2.4kW	Hi Rise	Yes	Dual	Incan.	53
76569-LED	20A	2.4kW	Hi Rise	Yes	Dual	Incan.	53
76570	20A	2.4kW	Constant	Yes	Dual	Incan.	59
76571	20A	2.4kW	Nondim	Yes	Dual	Incan.	56
76571-LED	20A	2.4kW	Nondim	Yes	Dual	Incan.	56
76572	20A	2.4kW	Sinewave	Yes	Dual	Incan.	62
76573	20A	2.4kW	Basic	No	Quad	Incan.	54
76574	50A	6.0kW	Basic	No	Single	Incan.	83
76575	50A	6.0kW	Standard	No	Single	Incan.	83

Catalog #	Ampacity	Kw	Type	Reporting	Number of Chans	Load	Module Type
76576	50A	6.0kW	Hi Rise	No	Single	Incan.	83
76577	50A	6.0kW	Constant	No	Single	Incan.	85
76578	50A	6.0kW	Nondim	No	Single	Incan.	84
76579	50A	6.0kW	Basic	Yes	Single	Incan.	83
76579-LED	50A	6.0kW	Basic	Yes	Single	Incan.	83
76580	50A	6.0kW	Standard	Yes	Single	Incan.	83
76580-LED	50A	6.0kW	Standard	Yes	Single	Incan.	83
76581	50A	6.0kW	Hi Rise	Yes	Single	Incan.	83
76581-LED	50A	6.0kW	Hi Rise	Yes	Single	Incan.	83
76582	50A	6.0kW	Constant	Yes	Single	Incan.	85
76583	50A	6.0kW	Nondim	Yes	Single	Incan.	84
76583-LED	50A	6.0kW	Nondim	Yes	Single	Incan.	84
76584	100A	12.0kW	Constant	No	Single	Incan.	89
76585	100A	12.0kW	Basic	No	Single	Incan.	87
76586	100A	12.0kW	Constant	Yes	Single	Incan.	89
76586-LED	100A	12.0kW	Constant	Yes	Single	Incan.	89
76587	100A	12.0kW	Basic	Yes	Single	Incan.	87
76587-LED	100A	12.0kW	Basic	Yes	Single	Incan.	87
76588	Blank	N/A	N/A	No	N/A	N/A	17
76589	N/A	2.4kW	Test Mod.	No	Dual	Incan.	53
76590	N/A	2.4kW	Test Mod.	No	Quad	Incan.	54
76591-0001	20A	2.4kW	Dim/Nondim	No	Dual	Incan.	63
76591-0002	20A	2.4kW	Nondim/Dim	No	Dual	Incan.	65
76591-0003	10A	1.2kW	Nondim	No	Quad	Incan.	23
76591-0004	15A	1.8kW	Nondim	No	Quad	Incan.	23
76591-0005	20A	2.4kW	Nondim	No	Quad	Incan.	23
76591-0006	15A	1.8kW	Basic	No	Quad	Incan.	37

230V Dimmer Modules

The following dimmer & non-dim modules are currently available for the 230V markets:

Catalog #	Ampacity	Kw	Type	Reporting	Number of Chans	Load	Module Type
76600	13A	2.5kW	Basic	No	Quad	Tungsten	2
76601	16A	3.0kW	Standard	No	Dual	Tungsten	91
76602	16A	3.0kW	Standard	No	Dual	Tungsten	91
76603	16A	3.0kW	Standard	No	Dual	Tungsten	91
76604	16A	3.0kW	Hi-Rise	No	Dual	Tungsten	91
76605	16A	3.0kW	Hi-Rise	No	Dual	Tungsten	91
76606	16A	3.0kW	Hi-Rise	No	Dual	Tungsten	91
76607	16A	3.0kW	Standard	Yes	Dual	Tungsten	91
76607-LED	16A	3.0kW	Standard	Yes	Dual	Tungsten	91
76608	16A	3.0kW	Standard	Yes	Dual	Tungsten	91
76608-LED	16A	3.0kW	Standard	Yes	Dual	Tungsten	91
76609	16A	3.0kW	Standard	Yes	Dual	Tungsten	91
76610	16A	3.0kW	Hi-Rise	Yes	Dual	Tungsten	91
76610-LED	16A	3.0kW	Hi-Rise	Yes	Dual	Tungsten	91
76611	16A	3.0kW	Hi-Rise	Yes	Dual	Tungsten	91
76611-LED	16A	3.0kW	Hi-Rise	Yes	Dual	Tungsten	91
76612	16A	3.0kW	Hi-Rise	Yes	Dual	Tungsten	91
76613	25A	5.0kW	Standard	No	Dual	Tungsten	70
76614	25A	5.0kW	Standard	No	Dual	Tungsten	70
76615	25A	5.0kW	Standard	No	Dual	Tungsten	70
76616	25A	5.0kW	Hi-Rise	No	Dual	Tungsten	70
76617	25A	5.0kW	Hi-Rise	No	Dual	Tungsten	70
76618	25A	5.0kW	Hi-Rise	No	Dual	Tungsten	70
76619	25A	5.0kW	Standard	Yes	Dual	Tungsten	70
76619-LED	25A	5.0kW	Standard	Yes	Dual	Tungsten	70
76620	25A	5.0kW	Standard	Yes	Dual	Tungsten	70
76620-LED	25A	5.0kW	Standard	Yes	Dual	Tungsten	70
76621	25A	5.0kW	Standard	Yes	Dual	Tungsten	70
76622	25A	5.0kW	Hi-Rise	Yes	Dual	Tungsten	70
76622-LED	25A	5.0kW	Hi-Rise	Yes	Dual	Tungsten	70
76623	25A	5.0kW	Hi-Rise	Yes	Dual	Tungsten	70
76623-LED	25A	5.0kW	Hi-Rise	Yes	Dual	Tungsten	70
76624	25A	5.0kW	Hi-Rise	Yes	Dual	Tungsten	70
76625	50A	10.0kW	Standard	No	Single	Tungsten	83
76626	50A	10.0kW	Standard	No	Single	Tungsten	83
76627	50A	10.0kW	Standard	No	Single	Tungsten	83
76628	50A	10.0kW	Hi-Rise	No	Single	Tungsten	83
76629	50A	10.0kW	Hi-Rise	No	Single	Tungsten	83
76630	50A	10.0kW	Hi-Rise	No	Single	Tungsten	83
76631	50A	10.0kW	Standard	Yes	Single	Tungsten	83

Catalog #	Ampacity	Kw	Type	Reporting	Number of Chans	Load	Module Type
76631-LED	50A	10.0kW	Standard	Yes	Single	Tungsten	83
76632	50A	10.0kW	Standard	Yes	Single	Tungsten	83
76632-LED	50A	10.0kW	Standard	Yes	Single	Tungsten	83
76633	50A	10.0kW	Standard	Yes	Single	Tungsten	83
76634	50A	10.0kW	Hi-Rise	Yes	Single	Tungsten	83
76634-LED	50A	10.0kW	Hi-Rise	Yes	Single	Tungsten	83
76635	50A	10.0kW	Hi-Rise	Yes	Single	Tungsten	83
76635-LED	50A	10.0kW	Hi-Rise	Yes	Single	Tungsten	83
76636	50A	10.0kW	Hi-Rise	Yes	Single	Tungsten	83
76637	16A	3.0kW	Sinewave	Yes	Dual	Tungsten	100
76638	16A	3.0kW	Sinewave	Yes	Dual	Tungsten	100
76639	16A	3.0kW	Sinewave	Yes	Dual	Tungsten	100
76640	25A	5.0kW	Sinewave	Yes	Dual	Tungsten	76
76641	25A	5.0kW	Sinewave	Yes	Dual	Tungsten	76
76642	25A	5.0kW	Sinewave	Yes	Dual	Tungsten	76
76643	16A	3.0kW	Fluor	No	Single	Flour	106
76644	16A	3.0kW	Fluor	No	Single	Flour	106
76645	16A	3.0kW	Fluor	No	Single	Flour	106
76646	16A	3.0kW	Nondim	No	Dual	Tungsten	94
76647	16A	3.0kW	Nondim	No	Dual	Tungsten	94
76648	16A	3.0kW	Nondim	No	Dual	Tungsten	94
76649	16A	3.0kW	Nondim	Yes	Dual	Tungsten	94
76649-LED	16A	3.0kW	Nondim	Yes	Dual	Tungsten	94
76650	16A	3.0kW	Nondim	Yes	Dual	Tungsten	94
76650-LED	16A	3.0kW	Nondim	Yes	Dual	Tungsten	94
76651	16A	3.0kW	Nondim	Yes	Dual	Tungsten	94
76652	25A	5.0kW	Nondim	No	Dual	Tungsten	72
76653	25A	5.0kW	Nondim	No	Dual	Tungsten	72
76654	25A	5.0kW	Nondim	No	Dual	Tungsten	72
76655	25A	5.0kW	Nondim	Yes	Dual	Tungsten	72
76655-LED	25A	5.0kW	Nondim	Yes	Dual	Tungsten	72
76656	25A	5.0kW	Nondim	Yes	Dual	Tungsten	72
76656-LED	25A	5.0kW	Nondim	Yes	Dual	Tungsten	72
76657	25A	5.0kW	Nondim	Yes	Dual	Tungsten	72
76658	16A	3.0kW	Constant	No	Dual	Tungsten	97
76659	16A	3.0kW	Constant	No	Dual	Tungsten	97
76660	16A	3.0kW	Constant	No	Dual	Tungsten	97
76661	16A	3.0kW	Constant	Yes	Dual	Tungsten	97
76662	16A	3.0kW	Constant	Yes	Dual	Tungsten	97
76663	16A	3.0kW	Constant	Yes	Dual	Tungsten	97
76664	25A	5.0kW	Constant	No	Dual	Tungsten	74
76665	25A	5.0kW	Constant	No	Dual	Tungsten	74
76666	25A	5.0kW	Constant	No	Dual	Tungsten	74

Catalog #	Ampacity	Kw	Type	Reporting	Number of Chans	Load	Module Type
76667	25A	5.0kW	Constant	Yes	Dual	Tungsten	74
76668	25A	5.0kW	Constant	Yes	Dual	Tungsten	74
76669	25A	5.0kW	Constant	Yes	Dual	Tungsten	74
76670	16A	3.0kW	Test Mod	No	Dual	Tungsten	91
76671	16A	3.0kW	Test Mod	No	Dual	Tungsten	91
76672	16A	3.0kW	Test Mod	No	Dual	Tungsten	91
76673-0001	20A	4.0kW	Hi-Rise	Yes	Dual	Tungsten	53
76673-0002	20A	4.0kW	Nondim	Yes	Dual	Tungsten	56
76673-0003	13A	2.5kW	Nondim	No	Quad	Tungsten	23
76673-0004	16A	3.0kW	Fluor	Yes	Single	Flour	106
76673-0005	16A	3.0kW	Fluor	Yes	Single	Flour	106
76673-0006	16A	3.0kW	Fluor	Yes	Single	Flour	106

Rack Components   The C21/EC21 dimmer rack is a listed, free standing, factory assembly of welded steel and aluminum construction finished in a fine textured, scratch resistant coating.

Each C21/EC21 dimmer rack consists of a rack processor housing (RPH) with one or two rack processor modules (RPM), a fan module, and up to 24, 36 or 48 dimmer modules. The dimmer connectors at the back of the rack provide for load wire connection.   Main bus bars are provided for line wire connections. An earth ground lug is provided in the rack. The dimmer connectors in the rack are polarized to prevent dimmer modules being plugged into the different ampacity slots. The dimmer racks can be individually fed or bused together using an optional busing kit.

Large dimmer racks have provision for up to 48 dimmer modules. Mid-range dimmer racks have provision for up to 36 dimmer modules. Small dimmer racks have provisions for up to 24 dimmer modules. Dimmer modules contain one, two or four dimmers, and dimmer module types can be mixed within a rack in various combinations.
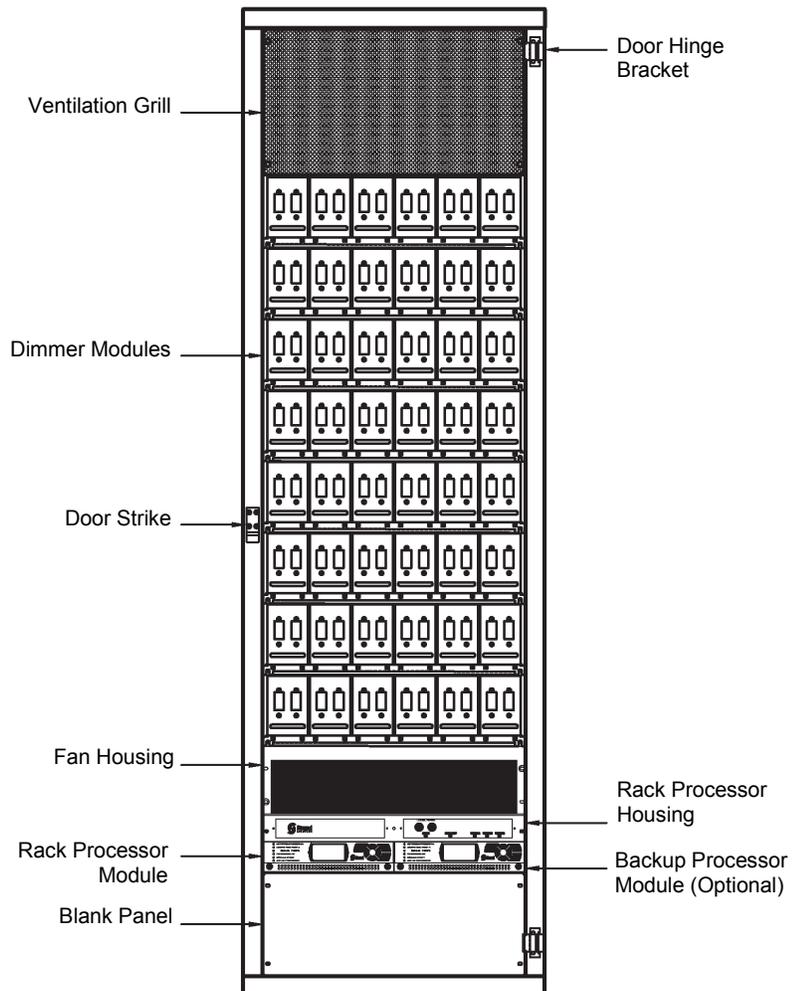

Figure 1 – C21/EC21 Series Dimmer Rack Fully Populated (doors removed)

Dimmer Modules

The power modules are the high power switching section of the C21/EC21 dimming system. The power block in this module is the interface between the high power AC and low power control. It is driven by low level signals (5mA, 3-24V) and switches high level signals (up to 100A, 120/240VAC). High specification filtering, SCR dimming, contactor non-dims, Sinewave dimming, and load status reporting electronics are available as options. Dimmers can be mixed in any combination in a rack. This lets you use the exact dimmer type needed for each circuit.

Quad dimming modules are also available in custom racks.

Power modules are constructed from aluminum, folded to form three sides of the dimmer and to support the dimmer connector and heatsink. The fourth side of the dimmer is formed by the heatsink. The top and bottom of the dimmer are open for cooling.

A sturdy handle is provided below the circuit breakers.

An optional mechanical locking bar on the dimmer tray secures the dimmers in the rack.
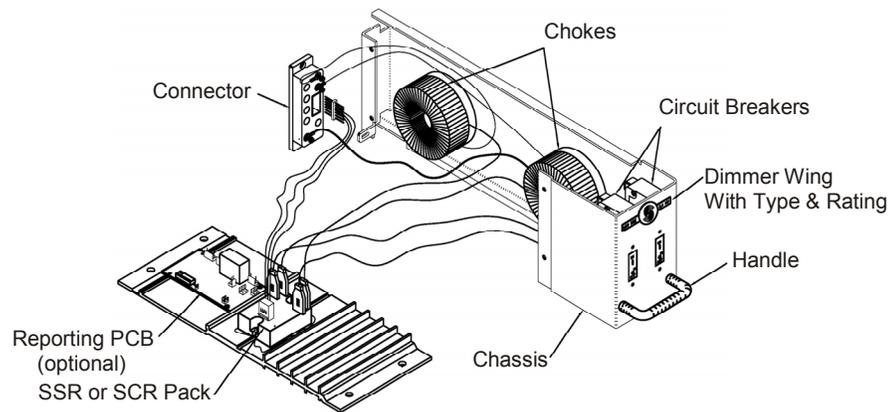

Figure 2 – Dual Dimmer Module

Reporting Dimmer Modules

Most C21/EC21 dimmer modules are available in load status reporting versions. Load status reporting versions of dimmers can be mixed in any combination with standard dimmers in C21/EC21 racks. These dimmers report many dimmer status items back to the processor. The information can be accessed through various menu items. The processor can then display a wide range of faults and diagnostic data.

Each Reporting dimmer module contains a temperature sensor which will shut it down if it overheats. Anything causing overheating in the rack will cause a gradual shutdown as each Reporting dimmer module overheats.

Fan Module The dimmer racks are cooled by a set of three low noise variable speed fans in a fan module at the bottom of the rack. The cooling system is designed to let the rack continue functioning if any one of the three fans fail. Cooling air is pushed up through the dimmer stack and exhausted through venting at the top of the rack. These fans are for dimmer cooling only, and can be set to fixed or variable speeds.

The fixed speed fan setting is for situations where changes in ambient noise are a problem. With this setting, the fans are always ON when the dimmer rack is in operation.

The variable speed fan setting minimizes noise and maximizes fan life. With this setting, the fan speed is adjusted so that fans reach full when 24 dimmers are at full, or equivalent (e.g., 48 dimmers at 50%). Increases in fan speed take 1 minute with this setting, while decreases in fan speed take 5 minutes. Fans are turned OFF when no dimmers are in use.
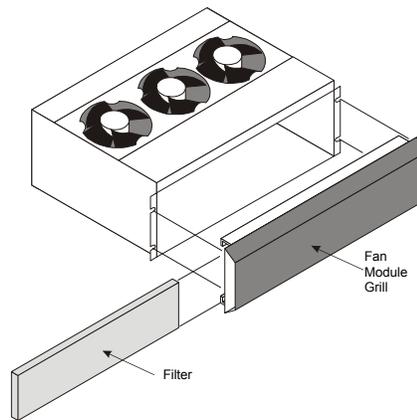

Figure 3 – Fan Housing

Rack Processor Housing Each C21/EC21 dimmer rack contains a rack processor housing (RPH) with all of the control electronics for the rack. This RPH contains the processor module(s) (RPM), control station power supplies, and control interconnection card (CIC) for the rack, and is shipped separately from the rack to minimize the possibility of damage.

This chassis can be equipped with one or two processor modules. The second processor module acts as a backup. The configuration data from either processor can be transferred into the other processor. The currently inactive processor always tracks the currently active processor.
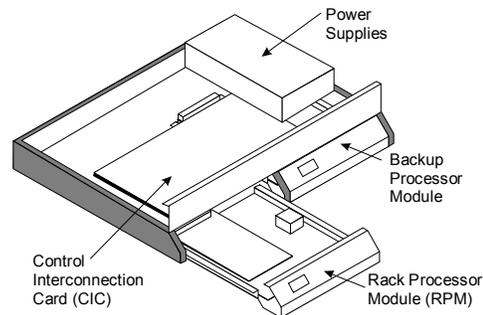

Figure 4 – Rack Processor Housing

Rack Processor Module

Each C21/EC21 rack contains one or two rack processor modules (RPM). Each processor module has a backlit LCD display, a 7 key keypad, and 6 LEDs to report processor module and dimmer status and allow setup and control at the rack. In normal operation, this display normally shows the rack name and the OK message. If there are any rack or dimmer events reported, the display will show error messages.

Pressing the ⬙ or ⬘ keys will takes you into a series of setup menus to view and set up the more frequently used C21/EC21 features. See Section 3, *Processor Module Programming* for details on accessing these functions.

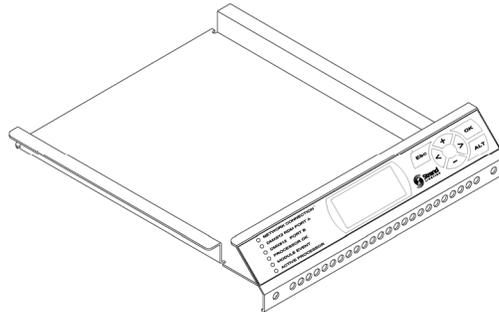All programmed data is held in battery maintained RAM for up to 6 months without power.

Figure 5 – Rack Processor Module

Power Supplies

Each C21/EC21 rack can have up to three power supplies, depending on the accessories provided. These power supplies are mounted on the rack processor housing.

Control Interconnection Card (CIC)

The electronics chassis also contains the control interconnection card (CIC). This is where the contractor terminates all control wiring for the rack. All control terminal strips are 2-part plug-in strips so that the electronics chassis can be easily removed from the rack.

Processor Configuration

Once you have applied power you need to make sure that the system is working correctly and the processor modules are set properly for the installation. This step checks for any problems due to shipping or installation.

Startup

When the rack is switched ON, a number of self-tests are run. The system displays the rack name.

```
┌─────────────────────────┐
│   STRAND LIGHTING        │
│       Rack 1             │
│                         │
│  <  or  > to select menu │
└─────────────────────────┘
```

When the self-tests are complete the PROCESSOR OK LED on the front of the processor module will turn ON, and the default text will show on the LCD display.
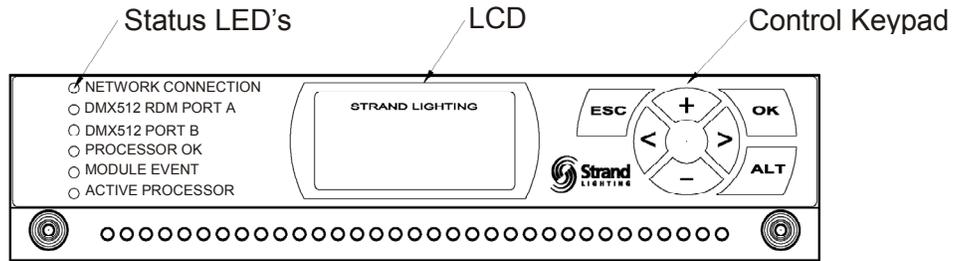
Status LED's   LCD   Control Keypad

Figure 6 - Processor Module Front Panel

If the MODULE EVENT LED is ON, check the dimmer event log to see which dimmer is causing problems. If any other LED does not illuminate correctly, switch OFF the power immediately and check the installation again. If all wiring seems correct, call Strand Lighting or your local Authorized Service Center.

If the LCD display shows an error, see the **Error Log** *section of chapter XX,* **Basic Troubleshooting.**

LED Status

The LEDs on the front of each rack processor module are the first level of diagnostics and provide immediate visual status indication. The nine LEDs on the front of the rack processor housing and module indicate the following:

Rack Processor Housing LEDs

Phase A (green):	Should be ON if PhaseA/Line1 is OK.
Phase B (green):	Should be ON if Phase B/Line 2 is OK.
Phase C (green):	Should be ON if PhaseC/Line 3 is OK.
Over-Temp (red):	Should be OFF. Flashing indicates an Over-Temp condition. ON indicates dimmer module automatic Over-Temp shutdown.
Panic (red):	Should be OFF. On indicates that PANIC has Been activated.
Lighthouse (blue):	Blue = normal. Flashing red = error. Solid red = shutdown.

Rack Processor Module LEDs

Network Connection (green):	Should be ON if there is a network signal.
DMX A (green):	Should be ON if there is a DMX signal.
DMX B (green):	Should be ON if there is a DMX signal.
Module Event (red):	Should be OFF. On indicates a dimmer fault
Processor OK (green):	Should be ON. Off indicates there is a problem.
Active Processor (green):	Should be ON if self-test is OK. Indicates active processor.

Dimmer Events   If the Module Event LED is on, the LCD will show the number of dimmer events and will automatically scroll the display to show a description of the event(s). Refer to the appendices section of this manual for a description of event codes. If any other LED does not illuminate correctly, switch OFF the power immediately and check the installation again. If the fault persists and all wiring seems correct, call Strand Lighting or your local Authorized Service Center (www.strandlighting.com).

After Startup   1.   Check the following items to make sure they are correctly set in the processor module:
- Module type (see *Rack Config Menu* in section 3, *Front Panel Programming*)
- Rack name (see *Rack Config Menu* in section 3, *Front Panel Programming*)
- Starting multiplex signal number and dimmer protocol (see *Patching Menu* in section 3, *Front Panel Programming*)
- Time and date (see *Rack Config Menu* in section 3, *Front Panel Programming*)

Other items you may wish to check at this time, depending on your system configuration, are:
- Mux patch (see *Patching Menu* in section 3, *Front Panel Programming*)
- Outlook patch (see *Patching Menu* in section 3, *Front Panel Programming*)
- Language (see *Rack Config Menu* in section 3, *Front Panel Programming*)
- Max Voltage (see *Rack Config Menu* in section 3, *Front Panel Programming*)
- Min Level (see *Rack Config Menu* in section 3, *Front Panel Programming*)

2.   Switch on all load circuit breakers.
3.   Connect a suitable luminaire to each outlet and check every dimmer using the SET LEVEL control facility, a suitable control console, or an SWC hand held controller. Investigate and correct any malfunctions you find.

If any dimmers do not work, stop and check the slot type for the dimmer. Dimmers will not work properly if their slot type is incorrectly assigned. Make sure that all of the modules are in their correct slots, and that the slot type for each dimmer is correctly set in the processor module.

5.   Install the fan screens, door, to complete the system installation.

Section 2 - Operational Features

Rack Configuration   The following configuration items are usually programmed during commissioning, but can also be reprogrammed by the user.

- Rack name.
- Panic selection and configuration
- Maximum output voltage (per dimmer): 20-250 volts (e.g. set to 105V for extended lamp life).
- Minimum level (per dimmer): 0% - 100% (e.g. set to 10% for aisle lights or large lamp preheat).
- Room and channel Patching (for applications using Outlook)
- Each dimmer can be patched to any valid DMX512 address number for the standard input A (DMX A), input B (DMX B) or network.
- Circuit ID—used by SWC and status reporting software.
- Record and recall presets (1-8, ON and OFF per room for Outlook control, and 0-128 per rack for System Wide Control).
- Define Preset Number or "Hold" condition on DMX failure.
- Define power-up preset per rack for Outlook architectural presets.
- Set LCD contrast.
- Error log accessible from the processor module or status reporting software.
- Individual dimmer reporting enable/disable.

Dimmer Configuration   Configuration items associated with the dimmer module can be set from the processor module front panel.

- The output response profile can be set to Linear, Square, S-Curve, Fluo-Electric (for electronic fluorescent ballasts), Fluo-Magnetic (for magnetic fluorescent ballasts), and Non-Dim. The two fluorescent settings let you set the top end voltage and the bottom end cutoff voltage. The Non-Dim setting lets you set the turn-on threshold for the non-dim. Five additional user programmable profiles are available through the *Set Rack Configuration* menu or from the optional status reporting software.
- Dimmer response (per dimmer): fast (30ms), normal (100ms) or slow (300ms). This determines a dimmer's rate of response to a change in control level. Slow is usually set for large tungsten loads to reduce filament inrush, medium or fast for small loads.
- Dimmer control assignment (per dimmer) to the "combined" levels of Outlook preset, SWC preset, DMX A, DMX B, Network or to a fixed level (0% - 99% or "Full"). The way in which the various input levels combine is also determined on a per dimmer basis by setting the dimmer DMX mode.
- A special smoothing algorithm is applied to small level changes to maintain smooth fades with long fade times.

Control Inputs   The Control Interconnection Card, or CIC, is the printed circuit board on which all contractor control wiring connections are made. It is located on the top of the Rack Processor Housing (RPH) and contains:

- An optional Ethernet switch, which connects to a Strand ShowNet system and is Advanced Network Control (ACN) ready. This switch allows for easy connections between dimmer racks. It also connects to the network receptacle located in the upper left rear of the dimmer rack.

- Two optically isolated DMX512 control inputs. The first input will accept DMX512. The second DMX512 input is configurable to accept either DMX512, Strand Lighting's System Wide Control (SWC) dimmer protocol or Strand Lighting's Outlook architectural protocol. Each DMX input has a patch to allow overlapping or separation of any DMX control level.

- Six optically isolated contact inputs, for:

Pin	Function	Type	Description
1	PANIC ON	Momentary	Turns Panic On
2	PANIC OFF	Momentary	Turns Panic Off
3	FIRE ALARM	Maintained	Turns Panic On, No Override
4	SWC PRESET 1	Momentary	Fires SWC Preset 1
5	GO NEXT SWC	Momentary	Fires "Next" SWC Preset
6	GO SWC OFF	Momentary	Fires SWC Preset 0 (Blackout)
7	Com/Gnd		Com/Gnd
8	Com/Gnd		Com/Gnd

- An Audio Visual Interface port. This serial input will support connection to an external A/V or show control system that supports an RS232 serial connection.

- 96 or 192 panic select switches

Safety Features

In order to minimize the impact of failures to any part of C21/EC21 series dimmer racks, a number of security features, some of which are optional, are provided.

Standard safety features for C21/EC21 series dimmer racks are:

- Convection cooling of all components with fan assist.
- Three fans located at the bottom of the rack.
- Module over-temperature shutdown (Reporter modules only).
- The processor module can be set to hold the last dimmer levels forever, or to fade to a specified SWC preset after a preset interval in cases of DMX signal failure.
- Setup data is stored in non-volatile RAM.
- 2500V optical isolation of DMX A and DMX B inputs, SWC, Outlook communication.
- All, or selected dimmers in a rack can be set to either Off or full On when the external Panic button is pressed.
- Automatic Panic on removal of processor module. In racks with two processor modules, both modules must be removed to activate Panic.
- Keypad lock.

Optional safety features for C21/EC21 series dimmer racks include:

- Redundant tracking backup (requires a second processor module fitted to the rack). The backup processor automatically tracks the master processor and takes over control of the dimmer rack on failure of the master processor.
- Status reporting software that lets you store setup data off-line.

System Wide Control (SWC)

SWC lets you control multiple C21/EC21 series dimmer racks from a single location. A hand held controller lets you program and recall all 128 presets, and control individual dimmers. 8 and 16 channel push-button stations let you record or recall any 8 or 16 of the 128 presets at each station. An audiovisual interface is also available to activate presets from external contacts. Contact Strand Lighting or see the *System Wide Control User's Manual* for details on how SWC works.

Outlook

Outlook is a comprehensive family of control stations designed for architectural applications needing a simple, flexible control solution with minimal installation and cabling costs. These control stations can access, modify, and recall lighting levels stored in the rack processor module. Outlook control station features and options include:

- Control up to 16 separate rooms, with up to 15 channels per room
- 8 preset scenes plus ON and OFF for each room
- Manual sliders (3, 6, 9, or 15 sliders per station) for direct control of individual circuits
- Record facility for saving slider levels for future push-button recall
- Programmable fade times between 0 and 4 minutes from Outlook control stations or 0 to 10 minutes from the processor module or status reporting software
- Record lockout facility for playback-only operation
- 1, 4, and 8 preset push-button stations
- Audio-visual interface
- Room combine stations for room partitioning

Section 3 - Programming the C21/EC21 Dimmer Rack

Controls and Displays You can access the range of C21/EC21 series dimmer rack programmable features using the Rack Processor Module keypad and 21 character, 8 line display. Menus are shown in English.

Status LED's   LCD   Control Keypad
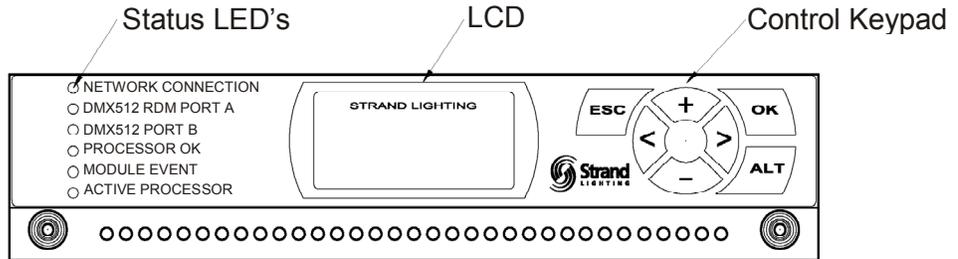
Figure 7 - Rack Processor Module Front Panel

The control buttons let you scan through the various menus and options and set the programmable features of the C21/EC21 series dimmer rack.

Key Lock To avoid accidental or unauthorized use of the keys, you can lock the keypad. When the Key Lock option is enabled, the processor keys are locked automatically after 10 minutes with no keyboard input. When disabled, the keys are unlocked. The factory default setting for this option is disabled. When locked, a key symbol is displayed on the lower-right side of the default display.

To temporarily unlock the keys

Press and hold ⌐ESC⌐ and ⌐OK⌐ simultaneously for at least 2 seconds.
Unless the Set Processor Key Lock option is disabled, the keys will again lock after 10 minutes of no key activity.

Using the Menu Keypad

The default display appears if no keys are pressed for 10 minutes, unless one or more error conditions have occurred. If more than one error has occurred, they are displayed continuously in sequence.

Press ⬡ or ⬡ to cycle through the status menu, which shows a summary of the main rack statistics.

In general the rack processor keys do the following:

⬡ Moves to the next menu or moves the cursor to the next digit of a field.

⬡ Moves to the next menu or moves the cursor to the next digit of a field.
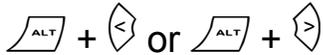
⬡ Increases the value of a digit or field.

⬡ Decreases the value of a digit or field.

⬡ Selects a menu or sub-menu. It is also pressed to accept changes when fields are edited.

⬡ Returns the display to the previous menu level. Most configuration changes will not take effect until the escape button has been pressed.

⬡ + ⬡ or ⬡ + ⬡ Selects a character group: numbers, capitol letters or lower-case letters.

If the ⬡ + ⬡ keys are pressed while editing a text field, the text will return to the previous unedited text.

Note: The blank "space" symbol is located under the numbers character group.
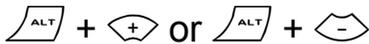
⬡ + ⬡ or ⬡ + ⬡ Sets the maximum value for a field.

The Status Log

The Status Log lets you quickly check the status of the rack, using the ⬡

or ⬡ keys to display each parameter in turn.

If one or more error conditions occur, the status display automatically shows the Error Log, if a Dimmer Event occurs, the Event Log is automatically displayed, Multiple errors or events are auto-scrolled.

The Status log for each rack, lists the rack number and software version number, together with the error code and description of the error.

Note: When the backup and main processor are functioning, both displays should show "Tracking." When the system is properly tracking, data is continuously copied from the "Enabled" processor (Master) to the "Disabled" processor (Backup). Phase current will always be 0 (zero) on the backup processor.

The Status Log will return to the default display 5 seconds after the last key press.

The Main Menu

The main menu lets you access all the other menus for configuring C21/EC21 series dimmer racks.

To access the main menu

From any of the status displays, Press ⟨<⟩ or ⟨>⟩

To return to the main menu

Press ⟨ESC⟩

Note: If no dimmer event is registered, returning from the main menu brings you back to the display from which you called the main menu. If a dimmer event is registered you will return to the dimmer events display.
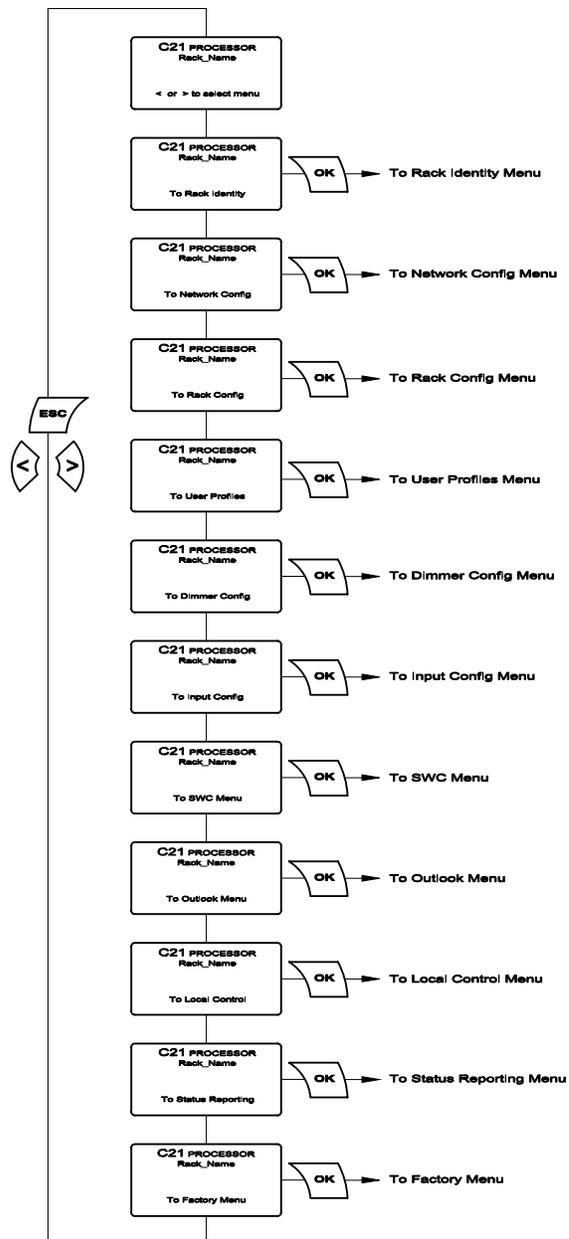
Rack Identity Menu

The Rack Identity menu allows you to configure the following settings for the dimmer rack:
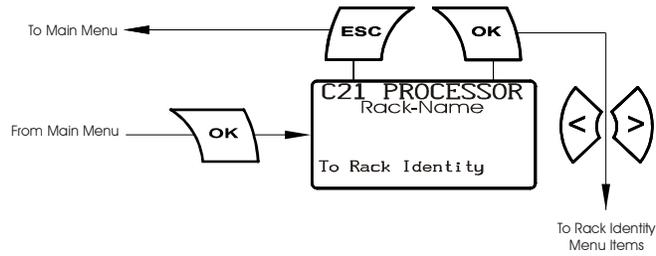
Set Rack Name

View or edit the name of the dimmer rack in this text field. The rack name is displayed on the second line of the display.
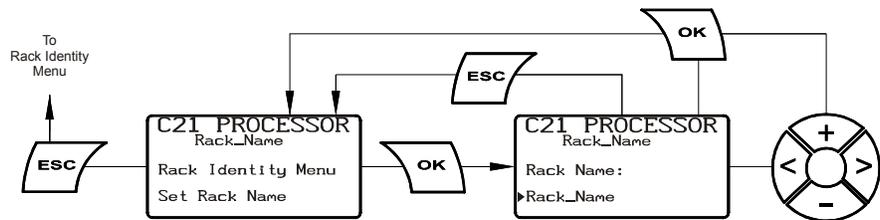
Set Rack Location

View or edit the location of the dimmer rack in this text field.
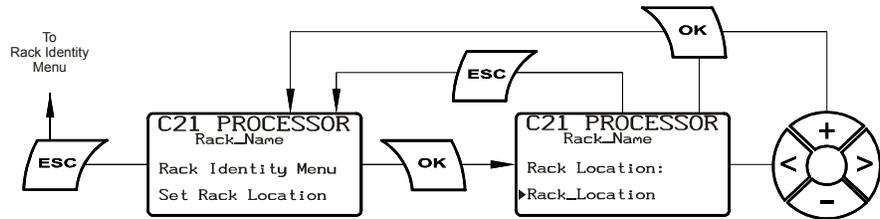
Set Main Breaker

View or edit the name or location of the main breaker in this text field.
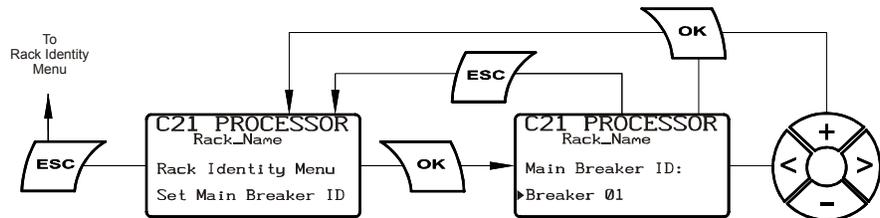
View Serial Number

Allows you to view the C21/EC21 Processor serial number. The serial number is entered by the factory and should not be changed in the field.

To
Rack Identity
Menu

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name

Rack Identity Menu
View Serial Number
```

```
C21 PROCESSOR
   Rack_Name

Serial Number
▶S-000000
```

OK
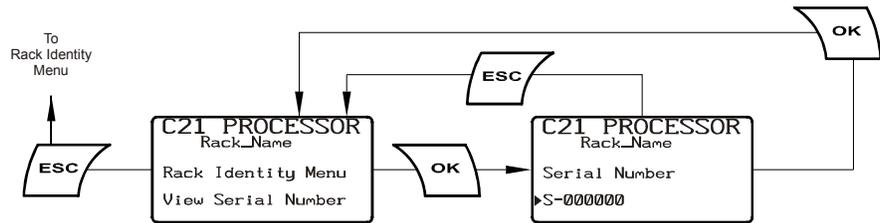
View Dealer Info.

Allows you to view the *Dealer Information* text field. The information for this text field is entered within the *Factory Menu* section.

To
Rack Identity
Menu

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name

Rack Identity Menu
View Dealer Info.
```

```
C21 PROCESSOR
   Rack_Name

Dealer Information:
Dealer Name
Ph: (123) 456-7890
Support@Company.com
```

OK
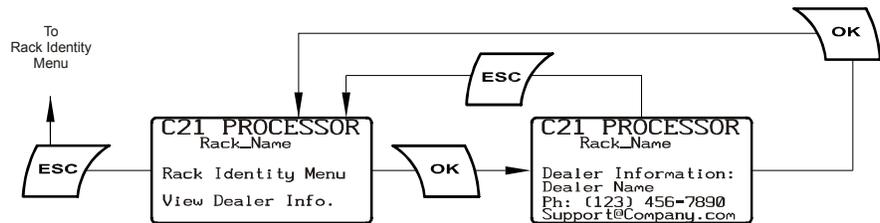
Set Date

Allows you to view or edit the date field.

Format: MM/DD/YY

To
Rack Identity
Menu

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name

Rack Identity Menu
Set Date
```

```
C21 PROCESSOR
   Rack_Name

Set Date:
▶10/07/05
```

OK
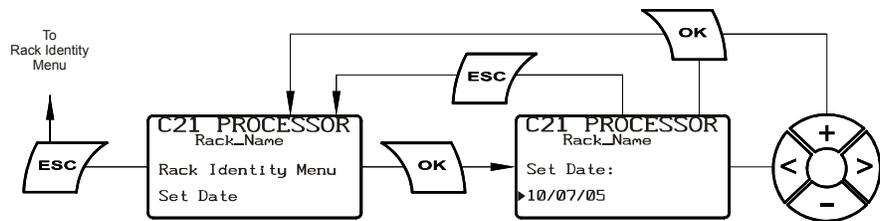
Set Time

Allows you to view or edit the time field.

Format: 24-hour (HH:MM:SS)

To
Rack Identity
Menu

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name

Rack Identity Menu
Set Time
```

```
C21 PROCESSOR
   Rack_Name

Set Time:
▶13:44:14
```

OK
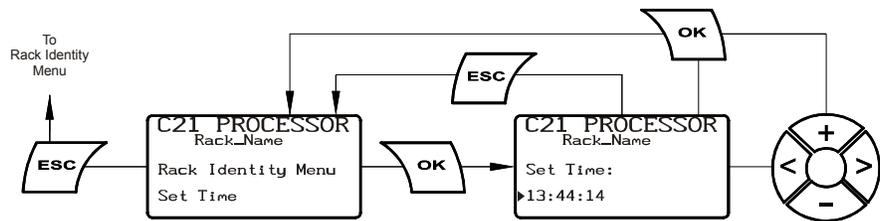
Set Temperature Scale   View or select the temperature scale

Options: Fahrenheit or Celsius

```
                                                          ┌──────┐
                                                          │  OK  │
                                                          └──────┘
        ┌───────────────────────────┐      ┌──────────┐
  To    │                           │      │   ESC    │
Rack Identity                       │      └──────────┘
  Menu  │                           ▼              │
        ↑                    ┌──────────────┐      ▼     ┌──────────────┐
  ┌──────┐                   │ C21 PROCESSOR│          │ C21 PROCESSOR│    ┌────────┐
  │ ESC  │───────────────────│   Rack_Name  │ ┌──────┐ │   Rack_Name  │    │   +    │
  └──────┘                   │              │ │  OK  │ │              │    └────────┘
                             │Rack Identity Menu│──────▶│Temperature Scale:│ ┌────────┐
                             │Set Temperature Scale│    │▶Fahrenheit   │    │   -    │
                             └──────────────┘          └──────────────┘    └────────┘
```

View Rack Size   Allows you to view the rack size (slot and dimmer count). The rack size is set in the *Factory Menu* section.

Default: 48 slot 96 Dims

```
                                                          ┌──────┐
                                                          │  OK  │
                                                          └──────┘
        ┌───────────────────────────┐      ┌──────────┐
  To    │                           │      │   ESC    │
Rack Identity                       │      └──────────┘
  Menu  │                           ▼              │
        ↑                    ┌──────────────┐            ┌──────────────┐
  ┌──────┐                   │ C21 PROCESSOR│          │ C21 PROCESSOR│
  │ ESC  │───────────────────│   Rack_Name  │ ┌──────┐ │   Rack_Name  │
  └──────┘                   │              │ │  OK  │ │              │
                             │Rack Identity Menu│──────▶│Rack Size:    │
                             │View Rack Size│            │▶48 Slot  96 Dims│
                             └──────────────┘          └──────────────┘
```
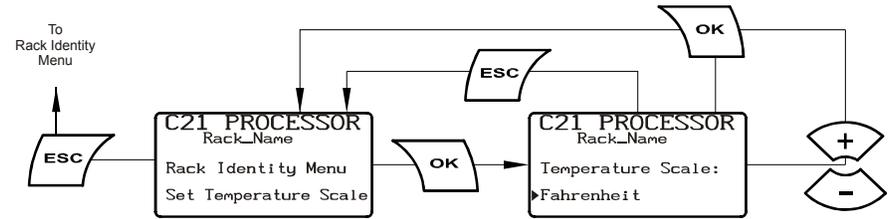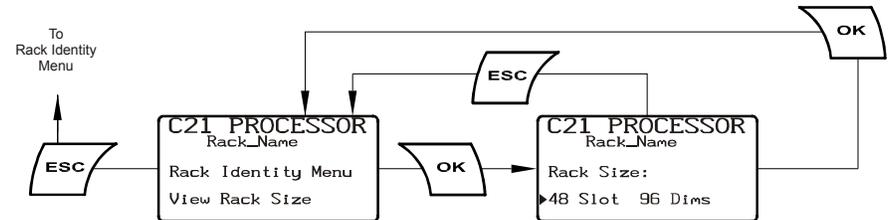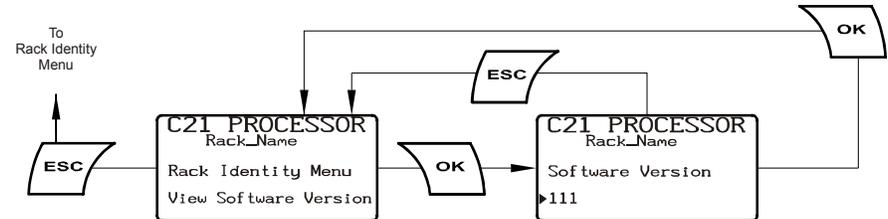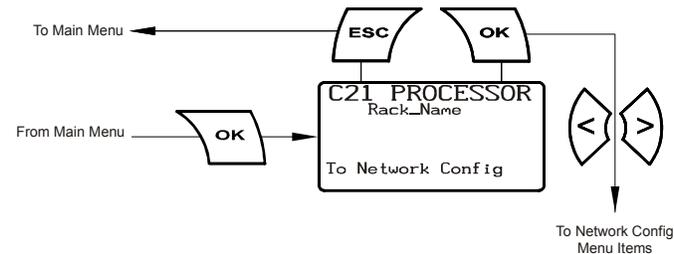
View Software Version   Allows you to view the current software version of the rack processor.

```
                                                          ┌──────┐
                                                          │  OK  │
                                                          └──────┘
        ┌───────────────────────────┐      ┌──────────┐
  To    │                           │      │   ESC    │
Rack Identity                       │      └──────────┘
  Menu  │                           ▼              │
        ↑                    ┌──────────────┐            ┌──────────────┐
  ┌──────┐                   │ C21 PROCESSOR│          │ C21 PROCESSOR│
  │ ESC  │───────────────────│   Rack_Name  │ ┌──────┐ │   Rack_Name  │
  └──────┘                   │              │ │  OK  │ │              │
                             │Rack Identity Menu│──────▶│Software Version│
                             │View Software Version│    │▶111          │
                             └──────────────┘          └──────────────┘
```

Network Config Menu   The Network Config menu allows you to configure the following settings for the network settings of the dimmer rack:

```
                          ┌──────┐ ┌──────┐
To Main Menu ◀────────────│ ESC  │ │  OK  │
                          └──────┘ └──────┘
                              │        │
                          ┌──────────────┐
                          │ C21 PROCESSOR│    ┌────┐┌────┐
                          │   Rack_Name  │    │ <  ││ >  │
From Main Menu ──┌──────┐ │              │    └────┘└────┘
               │  OK  │──│              │
               └──────┘  │To Network Config│
                          └──────────────┘       │
                                                  ▼
                                          To Network Config
                                             Menu Items
```
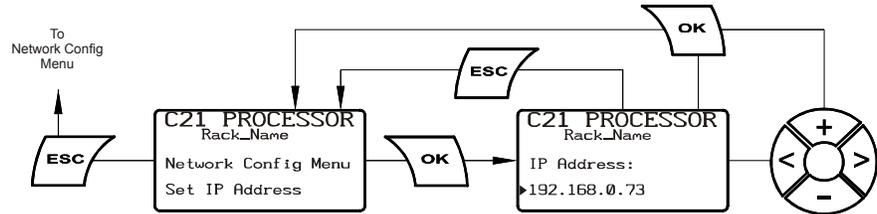
Set IP Address   Allows you to enter the IP address for the rack processor.

The default IP address is: 192.168.0.72

Note: Every rack processor is set to this default IP address. Make sure you create a unique number for each dimmer rack in the system prior to adding the racks to the network.
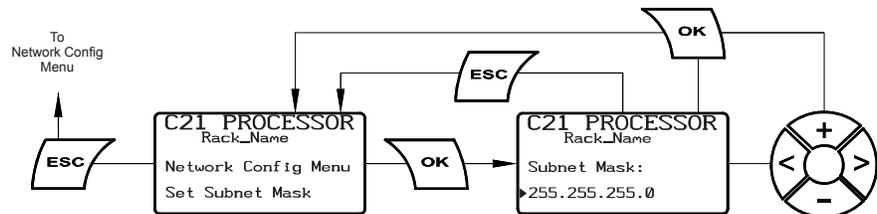

Set SubNet Mask   Allows you to set the SubNet Mask for the rack processor.

The default SubNet Mask is: 255.255.255.0.

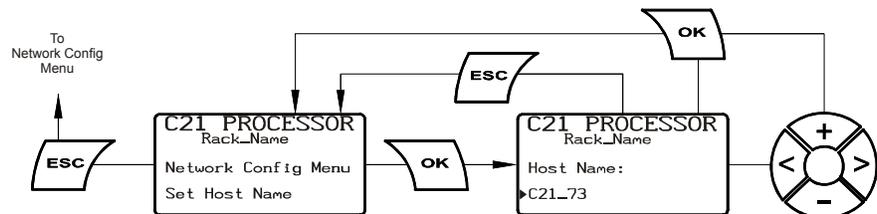*Note: The default subnet Mask should not be changed unless instructed to do so by Strand Lighting.*

Set Host Name   Allows you to set the Host Name for the processor.

Enter a unique name for the rack processor in this text field.

Note: This field is node name seen on the network and is different than the dimmer rack name created in the Rack Identity *Menu.*
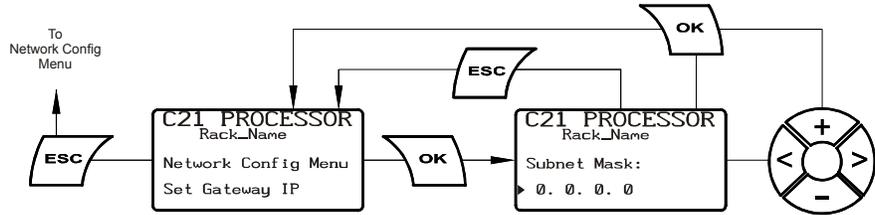
**Set Gateway IP** Allows you to set the Gateway IP address for the processor.

The default Gateway IP is: 0.0.0.0

Note: The default Gateway IP address should not be changed unless instructed to do so by Strand Lighting.
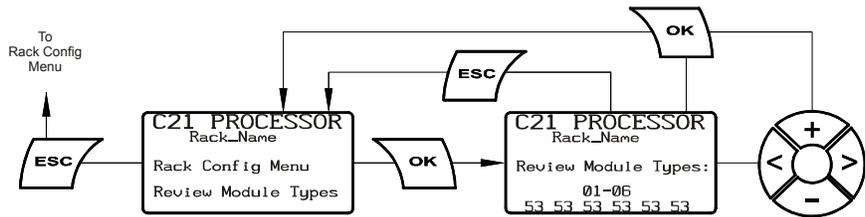
To
Network Config
Menu

ESC

OK

ESC

C21 PROCESSOR
Rack_Name

Network Config Menu
Set Gateway IP

OK

C21 PROCESSOR
Rack_Name

Subnet Mask:
▶ 0. 0. 0. 0

+
< >
−

Rack Config menu Rack Config Menu allows you to set the configuration of the dimmer rack.

To Main Menu

ESC

OK

From Main Menu

OK

C21 PROCESSOR
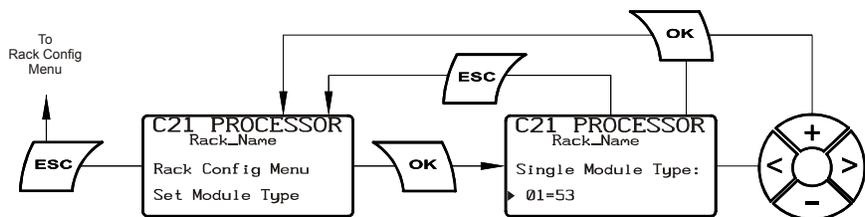Rack_Name

To Rack Config

< >

To Rack Config
Menu Items
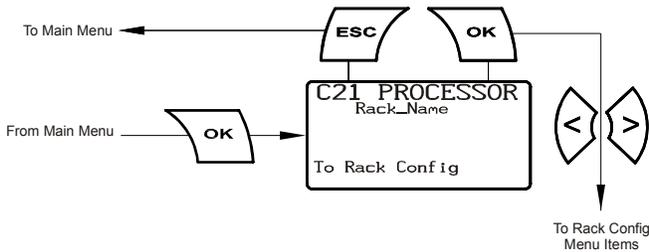
Review Module Types Allows you to review the dimmer module type (00 through 99) assigned to the dimmer slots, 6 dimmers at a time.

To
Rack Config
Menu

ESC

OK

ESC

C21 PROCESSOR
Rack_Name

Rack Config Menu
Review Module Types

OK

C21 PROCESSOR
Rack_Name

Review Module Types:
01-06
53 53 53 53 53 53

+
< >
−

Set Module Type Allows you to set a single dimmer module type (00 through 99) for each rack slot.

See Section 1 to view a list of the dimmer module types for the 120v and 230v markets.

To
Rack Config
Menu

ESC

OK

ESC

C21 PROCESSOR
Rack_Name

Rack Config Menu
Set Module Type

OK

C21 PROCESSOR
Rack_Name

Single Module Type:
▶ 01=53

+
< >
−

Set Module Type Range

Allows you to set the module type (00 through 99) for a range of dimmer rack slots.

See Section 1 to view a list of the dimmer module types for the 120v and 230v markets.

```
To
Rack Config
Menu
   ↑
ESC ──→  C21 PROCESSOR        OK   C21 PROCESSOR        +
         Rack_Name       ──→       Rack_Name        < >
         Rack Config Menu           Range of Module Type:  −
         Set Module Type Range      ▶ 01-06=**
```
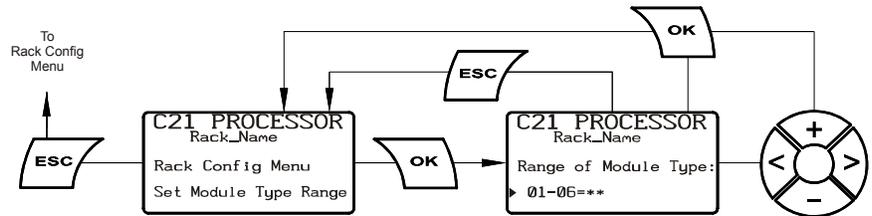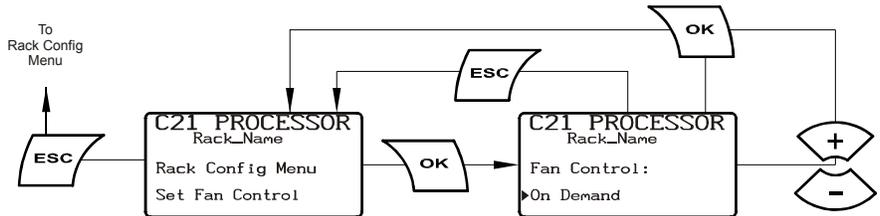
Set Fan Control

Allows you to view or edit the fan operation mode.

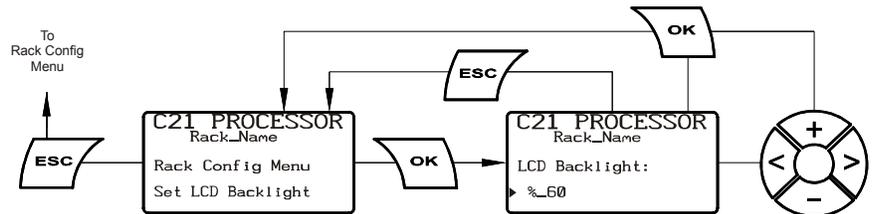Fan operation modes are:
On Demand: Fans cool based on load
On Control: Fans cool based on signal
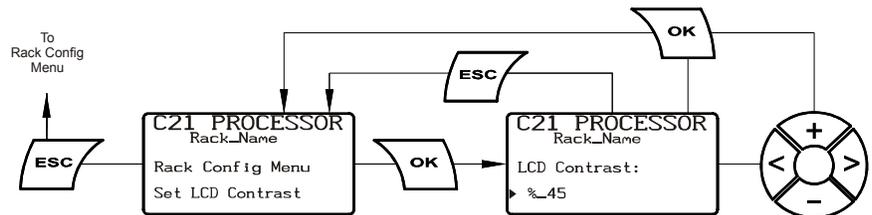Continuous: Fans run at 100%

```
To
Rack Config
Menu
   ↑
ESC ──→  C21 PROCESSOR        OK   C21 PROCESSOR        +
         Rack_Name       ──→       Rack_Name           −
         Rack Config Menu           Fan Control:
         Set Fan Control            ▶On Demand
```

Set LCD Backlight

Allows you to view or edit the LCD backlight.

```
To
Rack Config
Menu
   ↑
ESC ──→  C21 PROCESSOR        OK   C21 PROCESSOR        +
         Rack_Name       ──→       Rack_Name        < >
         Rack Config Menu           LCD Backlight:       −
         Set LCD Backlight          ▶ %_60
```

Set LCD Contrast

Allows you to view or edit the LCD Contrast.

```
To
Rack Config
Menu
   ↑
ESC ──→  C21 PROCESSOR        OK   C21 PROCESSOR        +
         Rack_Name       ──→       Rack_Name        < >
         Rack Config Menu           LCD Contrast:        −
         Set LCD Contrast           ▶ %_45
```
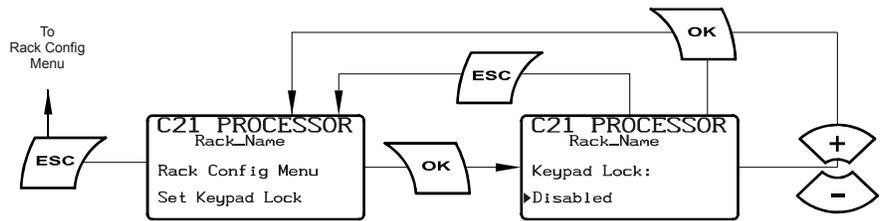
Set Keypad Lock
Allows you to enable or disable to keypad lockout.

The C21 processor incorporates a safety system to lock out the processor keys to prevent tampering by unauthorized personnel. When the keys are locked, a key symbol is displayed on the right-hand side of the LCD on the default display only. Under this condition, the keys are inoperable unless you press the ⏎ and ⏎ keys simultaneously, and hold them for about two seconds to release the lock. When enabled, the key lock will automatically lock the keys if no keys are pressed for a period of ten minutes.
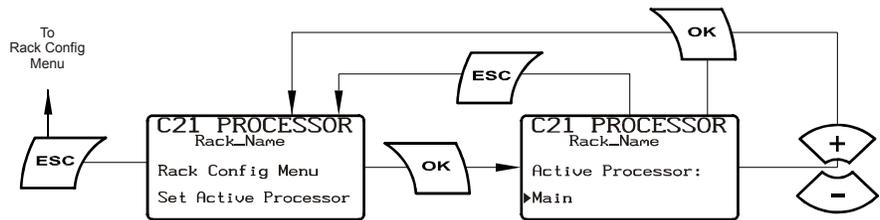
When disabled, the keys are always unlocked.

When set to enabled, keys are not locked and the key lock symbol is not displayed on the default display until ten minutes after the last key is pressed.
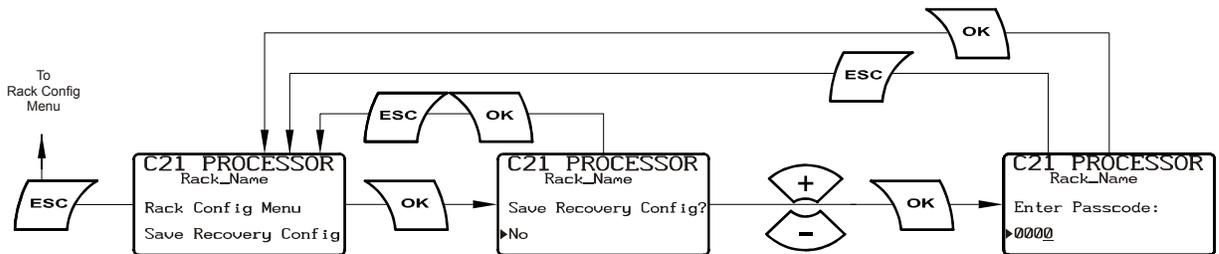
```
To
Rack Config
Menu
      ESC          OK                OK
                                            +
      ┌ESC┐   C21 PROCESSOR    C21 PROCESSOR
              Rack_Name    OK   Rack_Name      −
              Rack Config Menu  ▶Keypad Lock:
              Set Keypad Lock    Disabled
```

Set Active Processor
Allows you to select which processor, main or backup, will be active.

```
To
Rack Config
Menu
      ESC          OK                OK
                                            +
      ┌ESC┐   C21 PROCESSOR    C21 PROCESSOR
              Rack_Name    OK   Rack_Name      −
              Rack Config Menu  Active Processor:
              Set Active Processor ▶Main
```
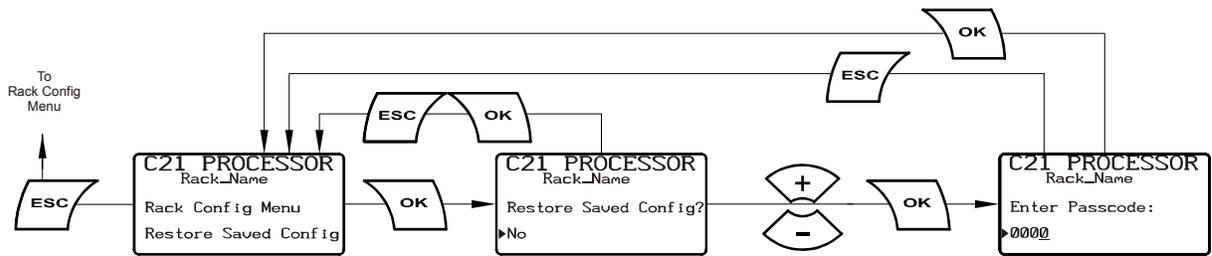
Save Recovery Config
Allows you to save the current processor configuration as a recovery file on the Control Interconnection Card (CIC) or to the flash RAM.
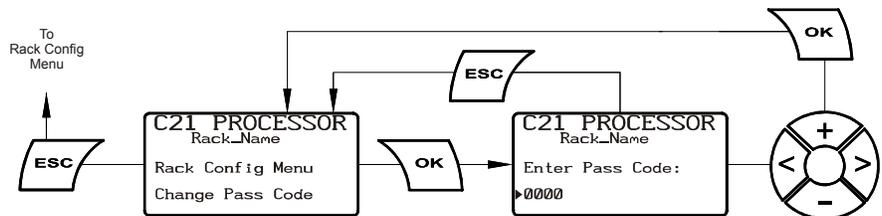
```
To
Rack Config
Menu
                                      OK
                         ESC  OK          ESC
      ┌ESC┐   C21 PROCESSOR    C21 PROCESSOR   +        C21 PROCESSOR
              Rack_Name        Rack_Name                Rack_Name
              Rack Config Menu  OK  ▶Save Recovery Config?  −   OK  Enter Passcode:
              Save Recovery Config  ▶No                            ▶0000
```

Restore Saved Config

Allows you to restore the saved configuration file from the Control Interconnection Card (CIC) or from the flash RAM .

To Rack Config Menu
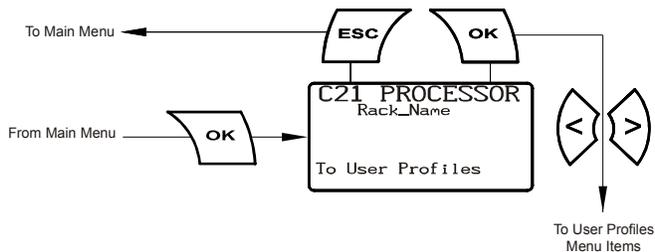
ESC

OK ESC OK

OK ESC

C21 PROCESSOR
Rack_Name
Rack Config Menu
Restore Saved Config

OK

C21 PROCESSOR
Rack_Name
Restore Saved Config?
►No

+ −

OK

C21 PROCESSOR
Rack_Name
Enter Passcode:
►000<u>0</u>

Change Pass Code

Allows you to create a 4-digit pass code for secured menu items.

Note: The Default pass code of '2606' is always enabled and cannot be changed.

To Rack Config Menu

OK ESC

ESC

C21 PROCESSOR
Rack_Name
Rack Config Menu
Change Pass Code

OK

C21 PROCESSOR
Rack_Name
Enter Pass Code:
►0000

+ < > −

User Profile Menu

User Profile Menu allows you to view and create the five user-defined dimming curves.

To Main Menu

ESC OK

From Main Menu

OK

C21 PROCESSOR
Rack_Name

To User Profiles

< >

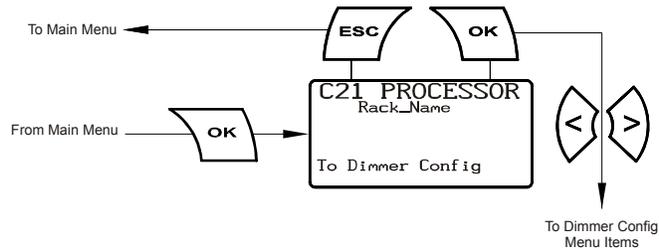To User Profiles Menu Items

Set User Profile

Allows you to view or edit five user-defined dimmer profiles (dimming curves) that may be applied using the *Select Profiles* function under the *Dimmer Config menu*. You can set the input and output values for up to 100 steps for each user profile.

To User Profile Menu

ESC

ESC ESC ESC OK

C21 PROCESSOR
Rack_Name
User Profile Menu
Set User Profile 1

< > OK

C21 PROCESSOR
Rack_Name
Profile Name:
►User1

+ < > −

OK

C21 PROCESSOR
Rack_Name
Number of Points:
►002

+ < > −

OK

C21 PROCESSOR
Rack_Name
Def. Profile Points:
Points Output
►001-0000

+ < > −

OK OK OK
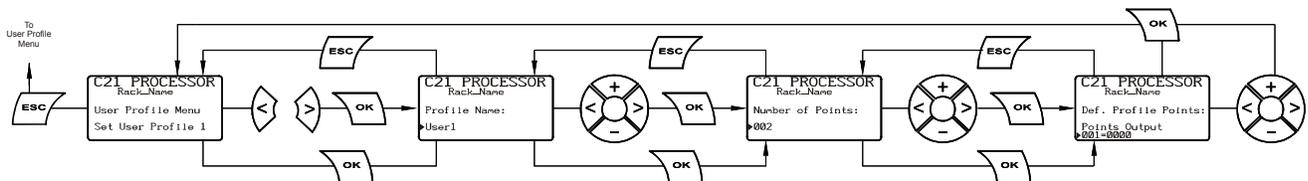
Dimmer Config Menu

Dimmer Config Menu allows you to set the configuration the dimmer modules and the priority of the discrete signals.

To Main Menu ← ESC   OK

From Main Menu → OK →

```
C21 PROCESSOR
  Rack_Name

To Dimmer Config
```

< >
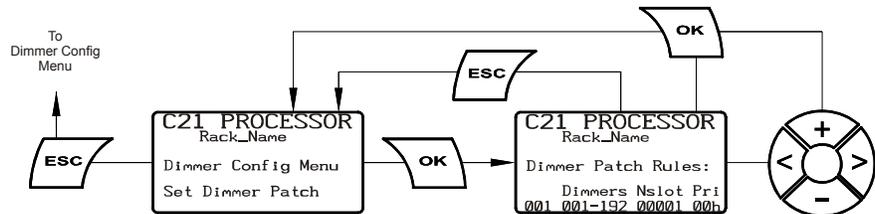
To Dimmer Config
Menu Items

Set Dimmer Patch

Allows you to assign ranges of dimmers to listen to net-slots at various priority or HTP levels.

Note: Below are the four default patches.

	Dimmers	Nslot	Pri
001	001-192	00001	00h
002	001-192	01537	01h
003	001-192	02049	02h
004	001-192	19001	00
005	*******	*****	***

Column #1	Lists the number of the patch
Column #2 - Dimmers	Lists the range of dimmers assigned to the patch.
Column #3 - Nslot (Netslot)	Lists the start number of the range
Column #4 - Pri (Priority)	Lists the priority number and if it is assigned as HTP

Note: By default all 192 possible dimmers are assigned. Generally this number will reflect the actual number of dimmers in the rack.

To
Dimmer Config
Menu

ESC ↑   OK

ESC

```
C21 PROCESSOR
  Rack_Name

Dimmer Config Menu
Set Dimmer Patch
```

OK →

```
C21 PROCESSOR
  Rack_Name

Dimmer Patch Rules:

  Dimmers Nslot Pri
001 001-192 00001 00h
```

+ < > −

View Full Output V.

Allows you to view the Maximum output voltage of the dimmers, six at a time.

To
Dimmer Config
Menu

OK

ESC

ESC ↑

```
C21 PROCESSOR
  Rack_Name

Dimmer Config Menu
View Full Output V.
```

OK →

```
C21 PROCESSOR
  Rack_Name
Full Output Volts:

     001-006
  118  118  118
  118  118  118
```

+ < > −
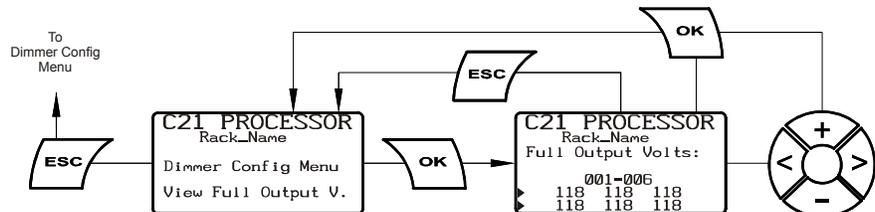
Set Full Output Volts   Allows you to set the Maximum output voltage for any range of dimmers in the rack. For instance, you can set the maximum voltage lower than the rated voltage of your lamps for improved lamp life. If you have lamps or other equipment which operate at a lower line voltage, you can set the output from the mdimmer to an appropriate voltage for the devices.

The maximum output voltage is applied to all dimmers and dimmers assigned as non-dims. It is not applied to contactor non-dims. You cannot use contactor non-dims for devices which need a maximum output voltage setting.

Note: This function sets the dimmer output voltage, not the maximum control level applied to the dimmer.

Caution: Be careful when using a maximum output voltage with dimmers set for PANIC. When panic is activated, full output voltage appears at the output of any dimmer or non-dim set for PANIC, regardless of how the maximum output voltage is set.
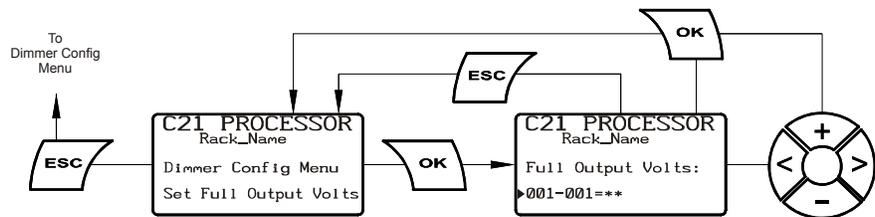
View Regulation Mode   Allows you to view the dimming curve assigned to a range of dimmers, 6 dimmers at a time.
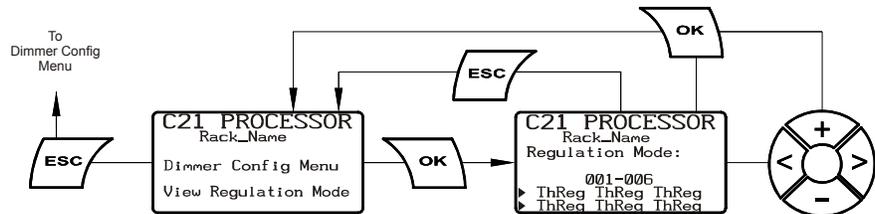
Set Regulation Mode   Allows you to set the Regulation Mode for a range of dimmers.
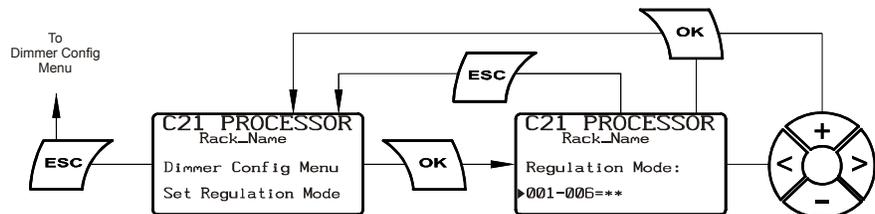
These options are:
SiUnr = SineWave dimmer unregulated
SiReg = SineWave dimmer regulated
N-Dim = Non-Dim
ThUnr = Thyristor dimmer unregulated
ThReg = Thyristor dimmer regulated

Set Circuit Names   Allows you to view or edit the Circuit ID number for individual dimmers.

To
Dimmer Config
Menu

ESC

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
Set Circuit Names

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Circuit Name:
▶001-00001

+
<   >
−

Autonumber Circuit ID   Allows you to automatically assign sequential circuit ID numbers to the dimmers.

To
Dimmer Config
Menu

ESC

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
Autonumber Circuit ID

OK

ESC

C21 PROCESSOR
Rack_Name
Autonumber Cir. ID:
▶Start 0001

+
<   >
−

OK

OK

C21 PROCESSOR
Rack_Name
Autonumber Cir. ID:
▶Confirm? No

+
−

Modify Load Profiles   Allows you to learn or clear the stored load profiles.

To
Dimmer Config
Menu

ESC

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
Modify Load Profiles

OK

ESC

C21 PROCESSOR
Rack_Name
Learn/Clear Loads:
▶Learn

+
−

OK

OK

C21 PROCESSOR
Rack_Name
Learn/Clear Loads:
▶Confirm? No

+
−

View Response Times   Allows you to view the response times for the dimmers, 6 dimmers at a time.

To
Modify Load
Profiles

To
Dimmer Config
Menu

ESC

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu

OK

<   >

ESC

C21 PROCESSOR
Rack_Name
Dimmer Dynamic Menu
View Response Times

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Response Time:
001-006
▶ Norm Norm Norm
▶ Norm Norm Norm

+
<   >
−

Set Response Times The response time of a dimmer is the rate at which it responds to increases or decreases in the control level. C21/EC21 dimmer racks provide three response times:

Slow = 300ms
Medium = 100ms
Fast = 30ms

These options can be applied to a single dimmer or a range of dimmers. Slow is generally used for large lamp loads, while fast is used for smaller lamp loads that might be used in a chase effect.

Note: The 'fast' setting, together with the accuracy of digital dimmers can cause very high inrush currents to flow. These may damage large lamp filaments and cause circuit breakers to trip. Only set dimmers to 'fast' if necessary for a particular effect. Do not use 'fast' for lamps that are 5Kw or higher.
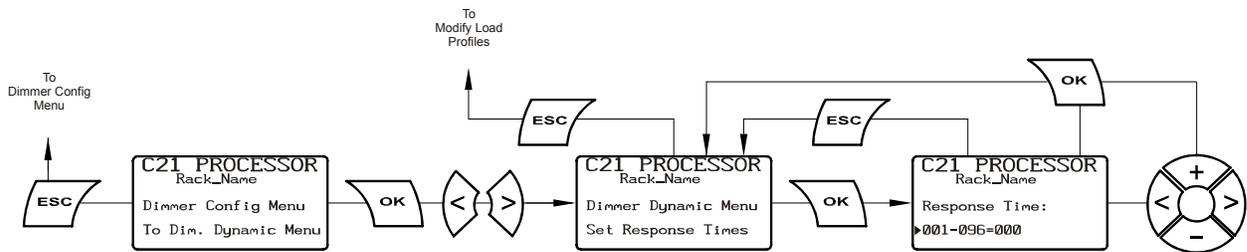
View Profiles Allow you to view the dimming curve for the dimmers, six dimmers at a time.
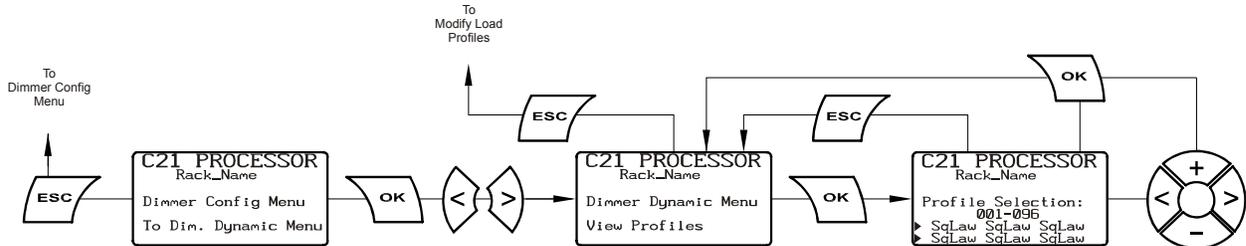
Select Profiles Allows you to select the dimming curve for a range of dimmers:

SqLaw = Square Law
S-Crv = S-Curve
LinPw = Linear
N-Dim = Non-Dim
FlEle = Fluorescent Electronic
FlMag = Fluorescent Magnetic
MarkX = Advanced Mark X Ballasts
User1 = User Defined Dimming Curve #1
User2 = User Defined Dimming Curve #2
User3 = User Defined Dimming Curve #3
User4 = User Defined Dimming Curve #4
User5 = User Defined Dimming Curve #5

ESC

OK

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu

< >

C21 PROCESSOR
Rack_Name
Dimmer Dynamic Menu
Select Profile

OK

ESC

ESC

OK

C21 PROCESSOR
Rack_Name
Profile Selection:
▶001-096=***

+ − < >
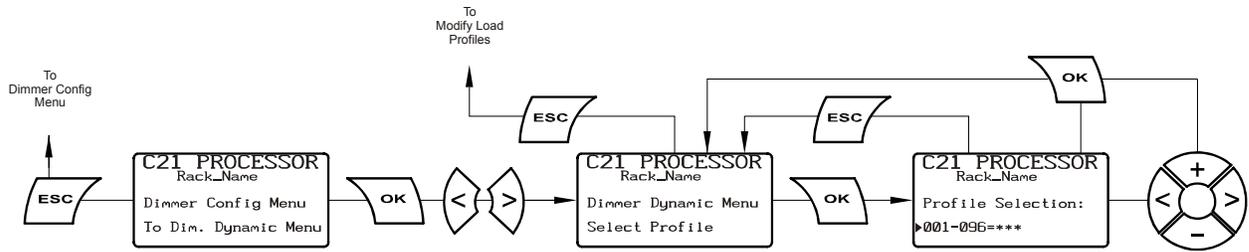
View Cut Levels

View Cut Levels

ESC

OK

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu

< >

C21 PROCESSOR
Rack_Name
Dimmer Dynamic Menu
View Cut Levels

OK

ESC

ESC

OK

C21 PROCESSOR
Rack_Name
Cut Level:
       001-006
   ▶   0   0   0
        0   0   0

+ − < >
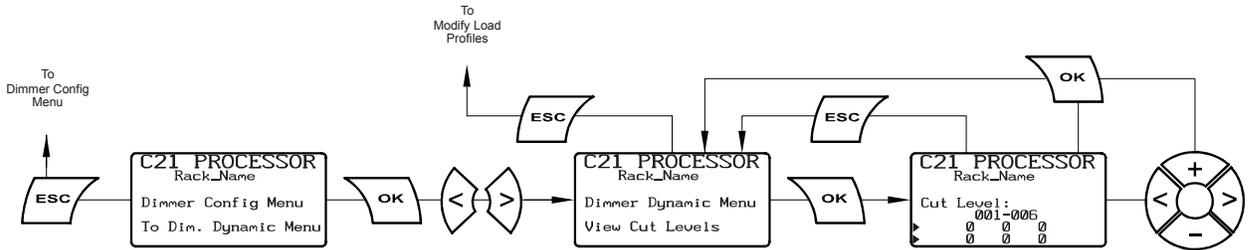
Set Cut Levels

Set Cut Levels

ESC

OK

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu

< >

C21 PROCESSOR
Rack_Name
Dimmer Dynamic Menu
Set Cut Levels

OK

ESC

ESC

OK

C21 PROCESSOR
Rack_Name
Cut Level:
▶001-096=***

+ − < >
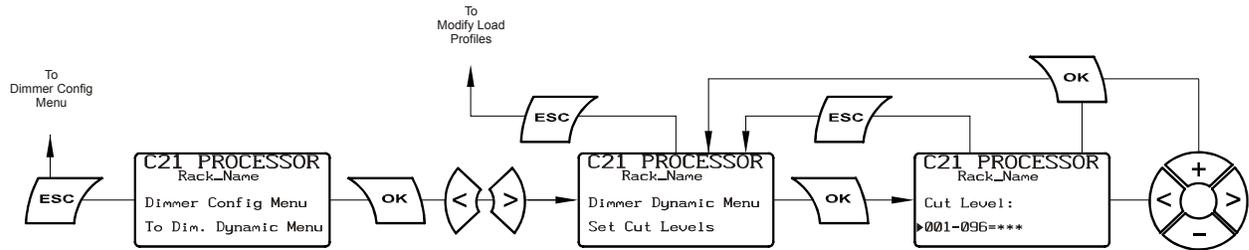
View Minimum Levels

Allows you to view the minimum dimmer output level, 6 dimmers at a time.

ESC

OK

C21 PROCESSOR
Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu

< >

C21 PROCESSOR
Rack_Name
Dimmer Dynamic Menu
View Minimum Levels

OK

ESC

ESC

OK

C21 PROCESSOR
Rack_Name
Minimum Level:
       001-006
   ▶   0   0   0
   ▶   0   0   0

+ − < >
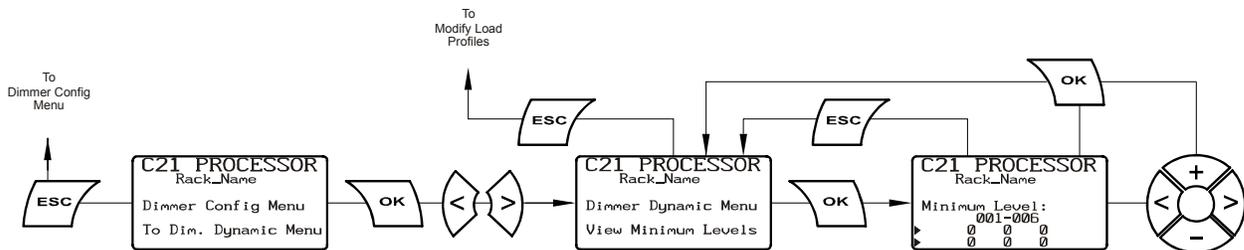
Set Minimum Levels

Allows you to set the minimum dimmer output level for a range of dimmers.

You can set a minimum level for any or all the dimmers. This can be used for security or safety lighting in locations where a minimum light level is required under all circumstances. This function can also be used as a preheat for large lamps. Minimum levels are displayed in control percentages.

Note: This function sets the minimum control level applied to the dimmer, not the minimum output voltage.

To Modify Load Profiles

To Dimmer Config Menu

ESC

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu
```

OK   < >

```
C21 PROCESSOR
   Rack_Name
Dimmer Dynamic Menu
Set Minimum Levels
```

OK

```
C21 PROCESSOR
   Rack_Name
Minimum Level:
▶001-096=***
```

+ < > −
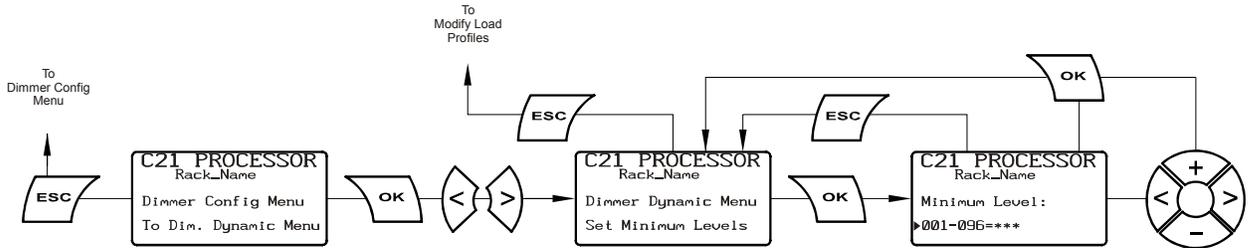
View Cable Comps

View Cable Comps

To Modify Load Profiles

To Dimmer Config Menu

ESC

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu
```

OK   < >

```
C21 PROCESSOR
   Rack_Name
Dimmer Dynamic Menu
View Cable Comps
```

OK

```
C21 PROCESSOR
   Rack_Name
Cable Compensation:
     001-006
   0    0    0
▶  0    0    0
```

+ < > −
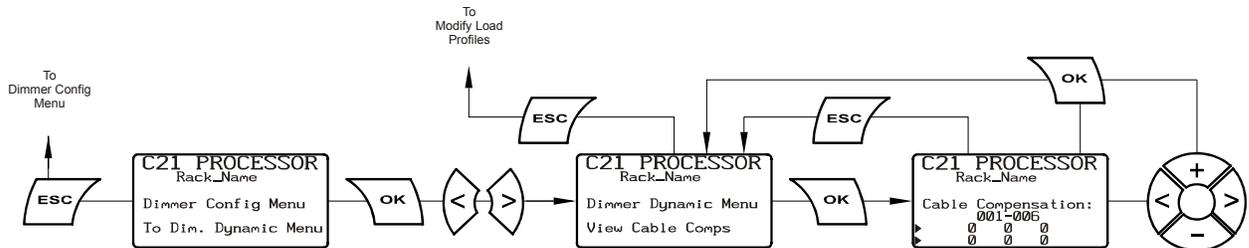
Set Cable Comps

Set Cable Comps

To Modify Load Profiles

To Dimmer Config Menu

ESC

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu
```

OK   < >

```
C21 PROCESSOR
   Rack_Name
Dimmer Dynamic Menu
Set Cable Comps
```

OK

```
C21 PROCESSOR
   Rack_Name
Cable Compensation:
▶001-096=***
```

+ < > −
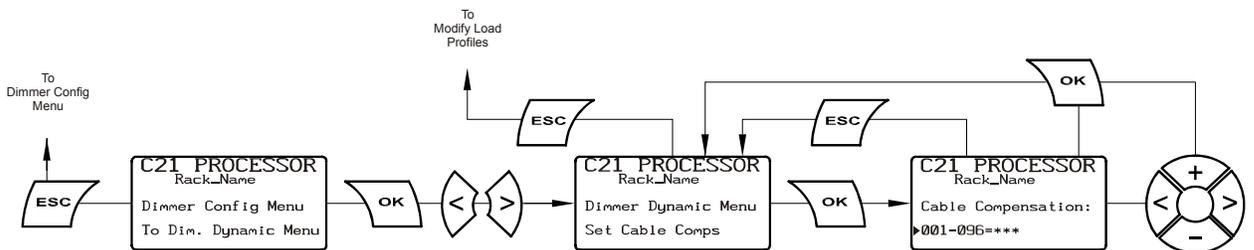
View Report Enables

View Report Enables

To Modify Load Profiles

To Dimmer Config Menu

ESC

ESC

OK

ESC

```
C21 PROCESSOR
   Rack_Name
Dimmer Config Menu
To Dim. Dynamic Menu
```

OK   < >

```
C21 PROCESSOR
   Rack_Name
Dimmer Dynamic Menu
View Report Enables
```

OK

```
C21 PROCESSOR
   Rack_Name
Report Enable:
     001-006
▶  On   On   On
   On   On   On
```

+ < > −
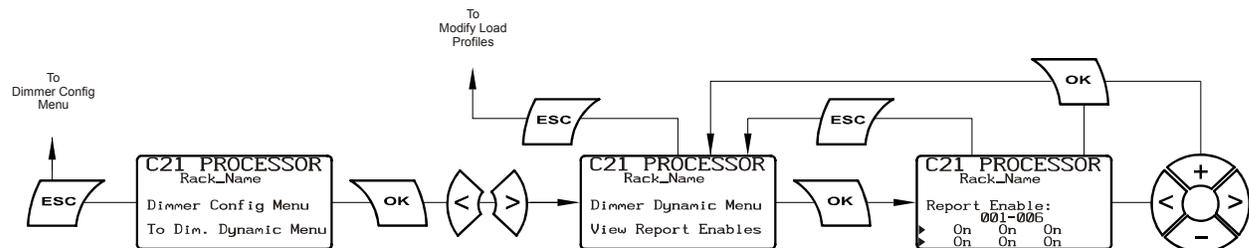
Set Report Enables

Set Report Enables


```
To                              To
Dimmer Config                   Modify Load
Menu                            Profiles

        C21 PROCESSOR                   C21 PROCESSOR                   C21 PROCESSOR
   ESC    Rack_Name      OK    <   >       Rack_Name        OK            Rack_Name        < + >
        Dimmer Config Menu             Dimmer Dynamic Menu           Report Enable:           -
        To Dim. Dynamic Menu           Set Report Enables            ▶001-096=***
```
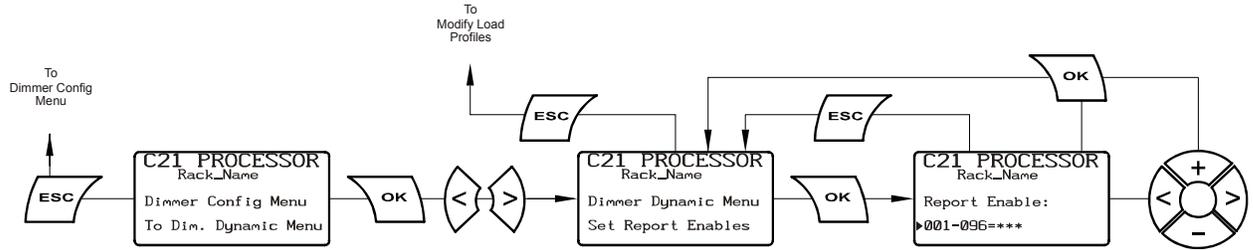
View Trip Modes

View Trip Modes


```
To                              To
Dimmer Config                   Modify Load
Menu                            Profiles

        C21 PROCESSOR                   C21 PROCESSOR                   C21 PROCESSOR
   ESC    Rack_Name      OK    <   >       Rack_Name        OK            Rack_Name        < + >
        Dimmer Config Menu             Dimmer Dynamic Menu           Trip Mode:               -
        To Dim. Dynamic Menu           View Trip Modes                    001-006
                                                                       Off   Off   Off
                                                                       Off   Off   Off
```
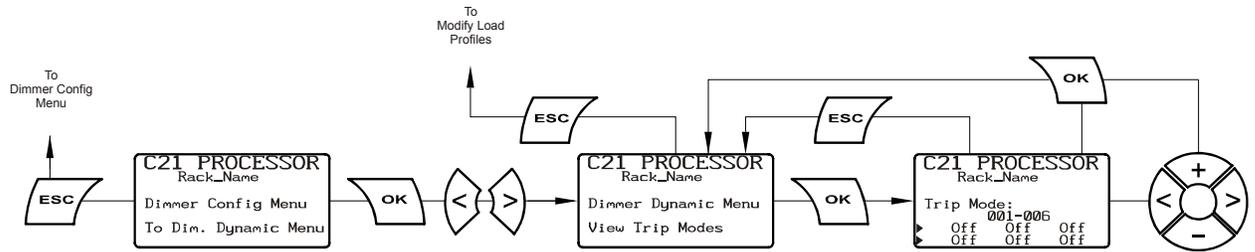
Set Trip Modes

Set Trip Modes


```
To                              To
Dimmer Config                   Modify Load
Menu                            Profiles

        C21 PROCESSOR                   C21 PROCESSOR                   C21 PROCESSOR
   ESC    Rack_Name      OK    <   >       Rack_Name        OK            Rack_Name        < + >
        Dimmer Config Menu             Dimmer Dynamic Menu           Trip Mode:               -
        To Dim. Dynamic Menu           Set Trip Modes               ▶001-096=***
```
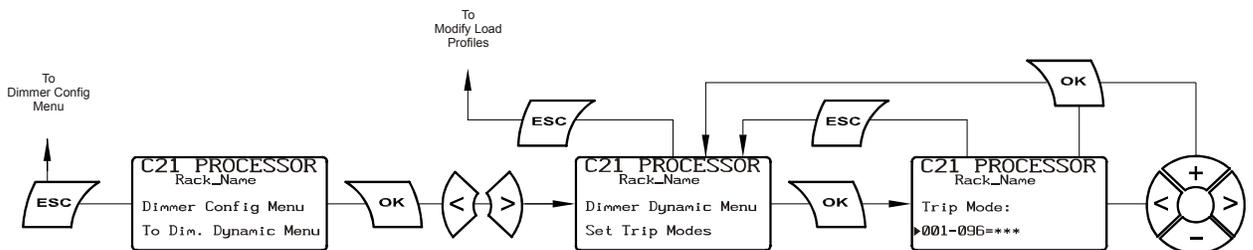
Input Config Menu   Input Config Menu allows you to view and set the Mux A and Mux B ports.
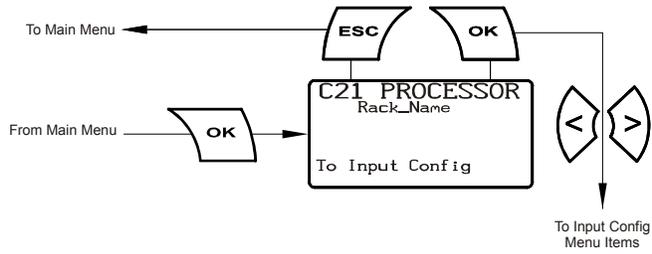
Set DMX A Options   Allows you to set the DMX A port:

Off = Turns the DMX A port off

In = Allows you to define the net-slot range for the DMX A port.

In 001-512 02001

The default setting shows that the DMX A port has been set to IN with a range of 512 DMX channels starting at 02001.
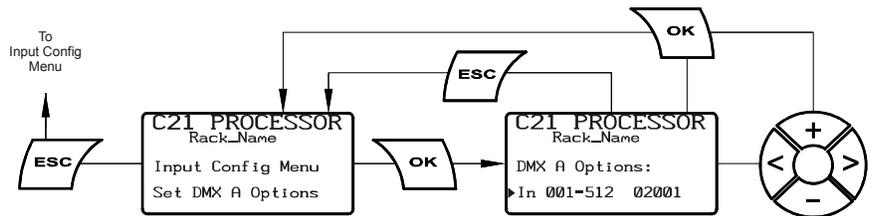
Set DMX A Label   Allows you to create a label for the DMX A port.
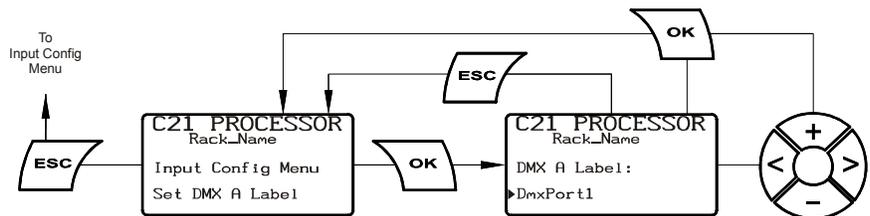
Set DMXB Options   Allows you to set the DMX A port :

Off = Turns the DMX A port off

In = Allows you to define the net-slot range for the DMX A port.

The default setting shows that the DMX B port has been set to IN with a range of 512 DMX channels starting at 03001.

In 001-512 03001

SMX = Allows you to define the port for Outlook and SWC control.

To
Input Config
Menu

ESC

C21 PROCESSOR
Rack_Name

Input Config Menu
Set DMX B Options

OK

C21 PROCESSOR
Rack_Name

DMX A Options:
In 001-512 03001

ESC

OK
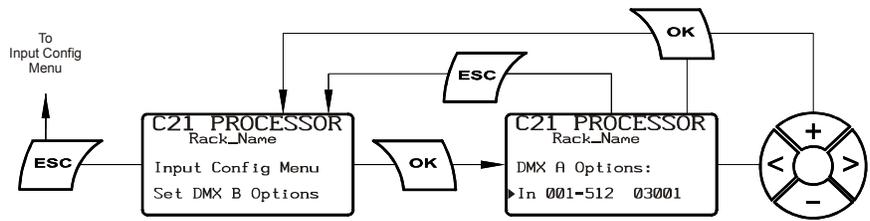
Set DMX B Label   Allows you to create a label for the DMX B port.

To
Input Config
Menu

ESC

C21 PROCESSOR
Rack_Name

Input Config Menu
Set DMX B Label

OK

C21 PROCESSOR
Rack_Name

DMX A Label:
▶DmxPort2

ESC

OK
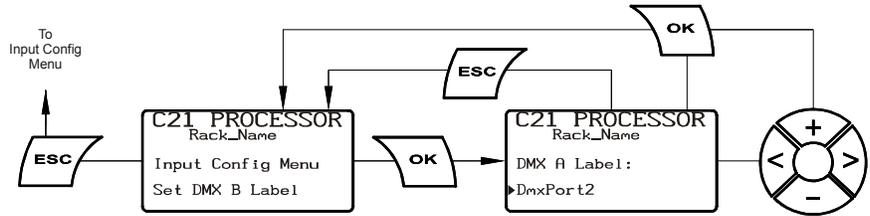
Set Panic Options   Set Panic Options

To
Input Config
Menu

ESC

C21 PROCESSOR
Rack_Name

Input Config Menu
Set Panic Options

OK

C21 PROCESSOR
Rack_Name

Panic Options:
_____

ESC

OK
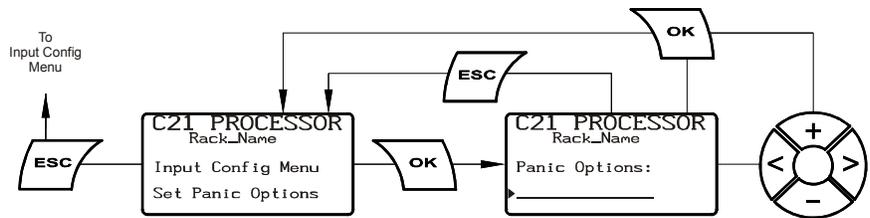
Enable AV Port   Enables the Serial input port on the CIC board.

Options: Enabled, Disabled

To
Input Config
Menu

ESC

C21 PROCESSOR
Rack_Name

Input Config Menu
Enable AV Port

OK

C21 PROCESSOR
Rack_Name

AV Port:
▶Enabled

ESC

OK
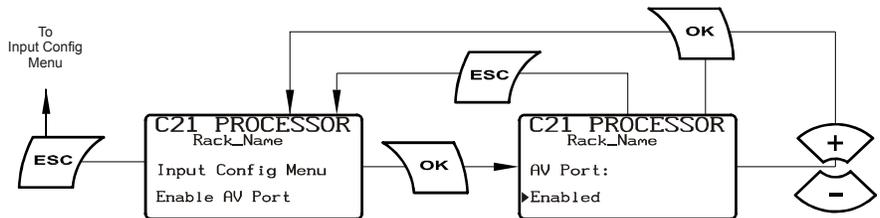
Messages are sent from an A/V controller at a maximum rate of 2 Hz
(2 messages per second).

UART Configuration:
9600 Baud, 8 data bits, No Parity, 1 stop bit

Message Overview:
Messages are composed of a short string of printing ASCII characters that request
certain actions from the rack processor. Messages are acknowledged by the
processor with confirming reply messages or with status update messages.
Messages are transmitted as byte streams terminated by designated printing ASCII
characters. There is no requirement for line termination. Received characters that
do not have a defined function in the protocol are ignored.

Message Composition:
Messages are composed of a single command character, followed by an optional numeric field that may be up to 3 characters long, followed by a single terminating character. Thus, complete messages range from 2 to 5 characters long.

Command	Parameter	Terminator
1 byte	0 to 3 bytes	1 byte

For all messages received from the AV controller, the terminating character is the letter 'Z' in either upper or lower case (0x5A or 0x7A).
For all messages transmitted from the C21 Rack Processor, the terminating character is the letter 'Y' (0x59).

The following messages are defined:

Play SWC Preset:
Command Code: 'S' or 's' (0x53 or 0x73)

Parameter:
Up to three digits indicating an SWC preset number in the range 0..128. '0' represents the "Off" preset.

Action:
The rack processor plays back the indicated SWC preset, and responds to the AV controller with the identical message terminated with the 'Y' character instead of 'Z'. If the preset number was out of range, the response message contains "???" instead of the preset requested.

Record SWC Preset:

Command Code:
'R' or 'r' (0x52 or 0x72)

Parameter:
Up to three digits indicating an SWC preset number in the range 1..128. '0' represents the "Off" preset so is not allowed with this command.

Action:
The rack processor records the indicated SWC preset, and responds to the AV controller with the identical message terminated with the 'Y' character instead of 'Z'. If the preset number was out of range, the response message contains "???" instead of the preset requested.

Play Outlook Preset:

Command Code:
 'O' or 'o' (0x4F or 0x6F)

Parameter:
Up to three digits that represent two numeric fields. The first one or two digits represent the room number. The last digit represents the preset number. The room number may range from 0..15. The preset number may range from 0..9. Preset 9 calls the "Full On" preset.

Action:
The rack processor plays back the indicated Outlook preset in the indicated room

and responds to the AV controller with the identical message terminated with 'Y' instead of 'Z'. If the room number was out of range, the response message contains "???" in place of the numeric parameter.

Record Outlook Preset:

Command Code:
'P' or 'p' (0x50 or 0x70)

Parameter:
Up to three digits that represent two numeric fields. The first one or two digits represent the room number. The last digit represents the preset number. The room number may range from 0..15. The preset number may range from 1..8. Presets 0 and 9 are not allowed as these are not recordable.

Action:
The rack processor records the indicated Outlook preset in the indicated room and responds to the AV controller with the identical message terminated with 'Y' instead of 'Z'. If the room number or preset number was out of range, the response message contains "???" in place of the numeric parameter.

Update System Status:

Command Code:
'U' or 'u' (0x55 or 0x75)

Parameter:
None

Action:
The rack processor responds by sending 17 response messages as defined above indicating the states of the SWC system and of each room in the Outlook system.

Examples:

AV Controller Request	C21 Rack Response
"S001Z"	"S001Y"

SWC preset 1 is now active.

"s123z"	"s123Y"

SWC preset 123 is now active.

"s200z"	"s???Y"

No change in SWC due to out of range parameter.

"o123z"	"o123Y"

No change in Outlook due to out of range parameter.

"UZ"	"S123Y" "O000Y" "O010Y" "O020Y"
	"O030Y" "O040Y" "O050Y" "O060Y"
	"O070Y" "O080Y" "O090Y" "O100Y"
	"O110Y" "O123Y" "O130Y" "O140Y"
	"O150Y"

SWC Menu

SWC Menu

```
To Main Menu  ◄────── ESC    OK

From Main Menu ── OK ──►  C21 PROCESSOR
                          Rack_Name

                          To SWC Menu                < >

                                          To SWC Menu
                                             Items
```
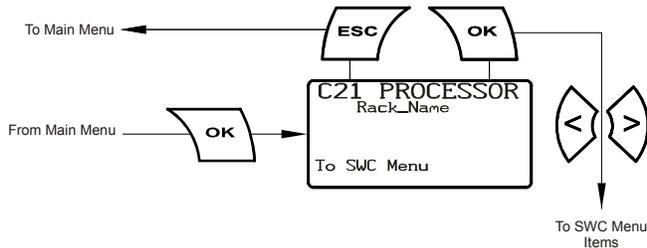
Call SWC Preset

Allows you to play-back one of the 128 SWC preset in the recorded time.

```
To
SWC
Menu
            OK
  ESC      C21 PROCESSOR          C21 PROCESSOR
           Rack_Name      OK      Rack_Name         + 
           SWC Menu       ──►     Call SWC Preset:  < >
           Call SWC Preset        ▶Off               -
                          ESC
```
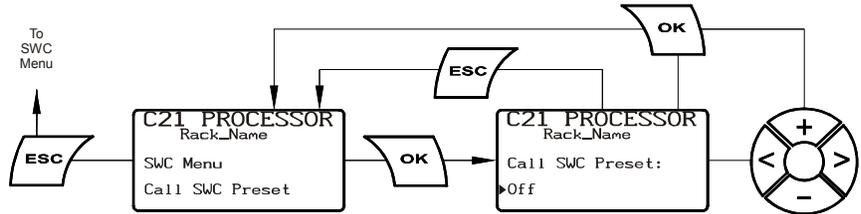
Record SWC Preset

Allows you to record to one of the 128 presets

```
To
SWC
Menu
            OK                                OK
  ESC   C21 PROCESSOR       C21 PROCESSOR        C21 PROCESSOR
        Rack_Name    OK     Rack_Name       OK   Rack_Name         +
        SWC Menu     ──►    Record SWC Preset: ─► Record SWC Preset 
        Record SWC Preset   ▶001              ESC ▶Confirm? No        -
                     ESC           + < > -
```
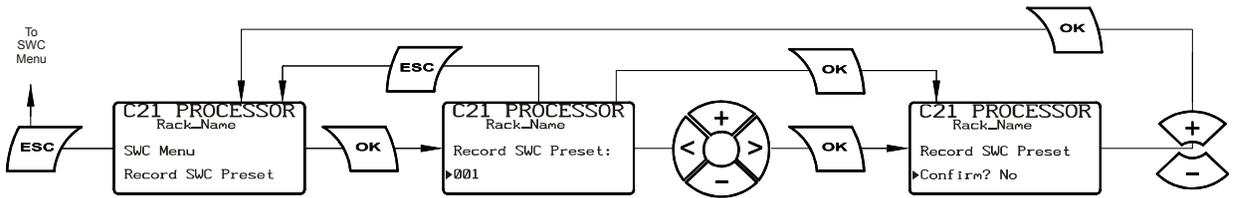
Set No Mux Preset

Allows you to select one of the 128 presets as the No Mux Preset.

```
To
SWC
Menu
            OK
  ESC      C21 PROCESSOR          C21 PROCESSOR
           Rack_Name      OK      Rack_Name        +
           SWC Menu       ──►     No MUX Preset:   < >
           Set No MUX Preset      ▶Off              -
                          ESC
```
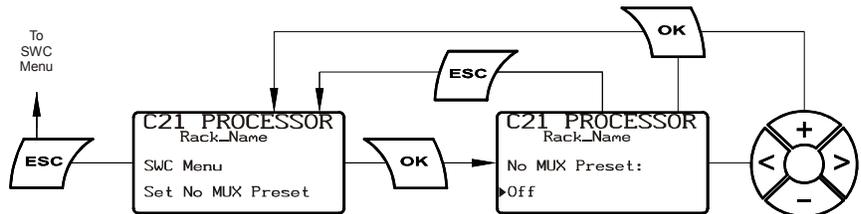
Set No Mux Hold Time

Allows you to record a Hold Time for the No Mux Preset.

```
To
SWC
Menu
            OK
  ESC      C21 PROCESSOR          C21 PROCESSOR
           Rack_Name      OK      Rack_Name         +
           SWC Menu       ──►     No MUX Hold Time: < >
           Set No MUX Hold Time   ▶00:2:30           -
                          ESC
```
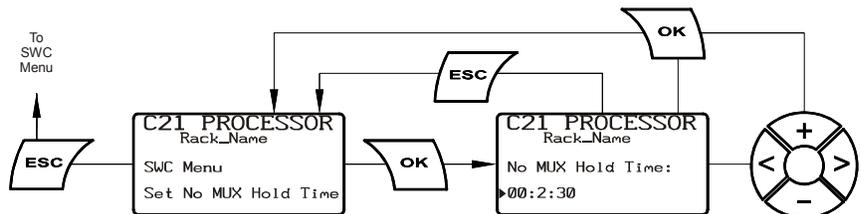
Set Fade Time

Allows you to record a Fade Time for and individual SWC preset.

The default is 0:00:03 seconds.
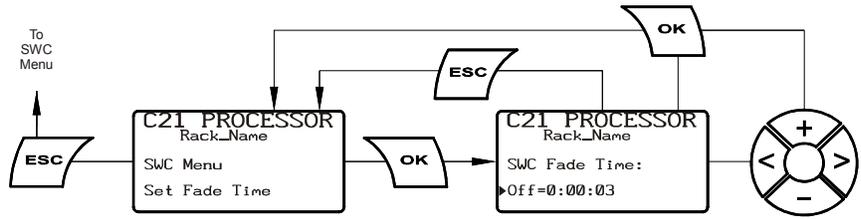
Set Fade Time Range

Allows you to record a Fade Time for a range of SWC presets.
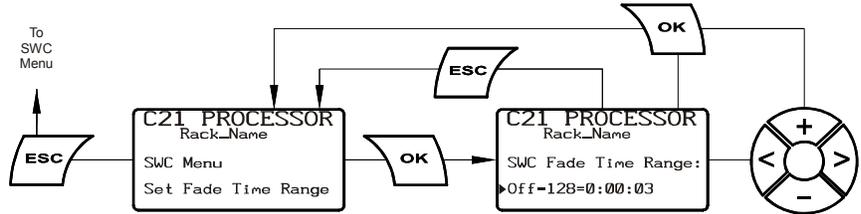
Edit SWC Event List

Allows you to view or edit 1of 24 events which will automatically recall an SWC preset based on any day and time of the week.
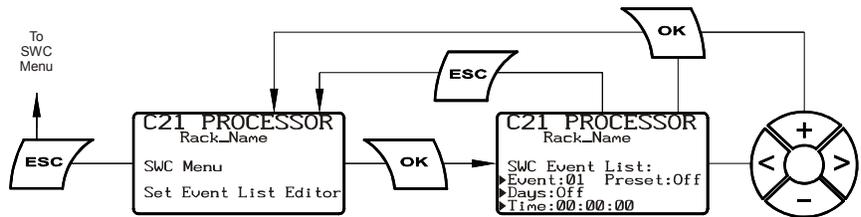
Outlook Menu

Outlook Menu
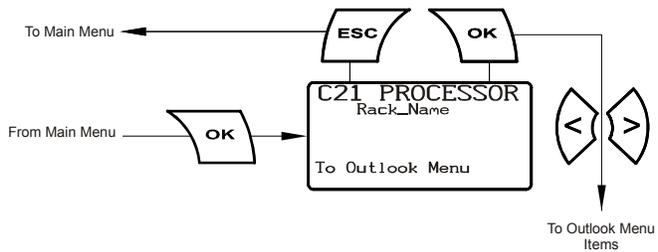
Call Outlook Preset

Allows you to recall an Outlook preset in one of the 16 Outlook rooms.
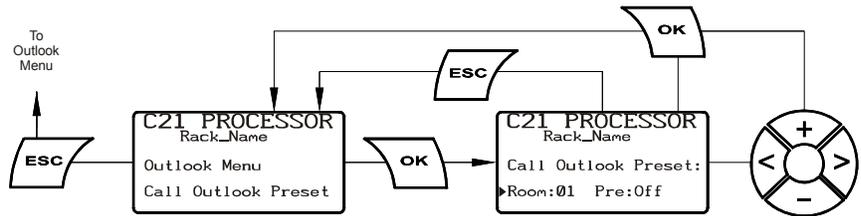
Call Outlook Pr. Range

Allows you to recall an Outlook preset in a range of Outlook rooms. (Feature currently not available).

Record Outlook Preset

Allows you to select the Outlook room and preset number to record.
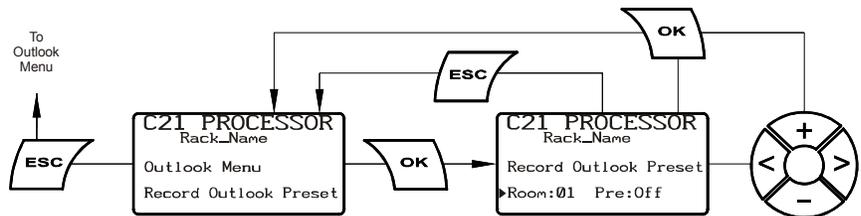
Record Outlook Pr. Range

Allows you to a range of Outlook rooms to record an Outlook preset into. (Feature currently not available).

Set Channel Levels

Set Channel Levels (Feature currently not available).

Set Ch. Levels Range

Set Ch. Levels Range (Feature currently not available).

Set Fade Time

Set Fade Time
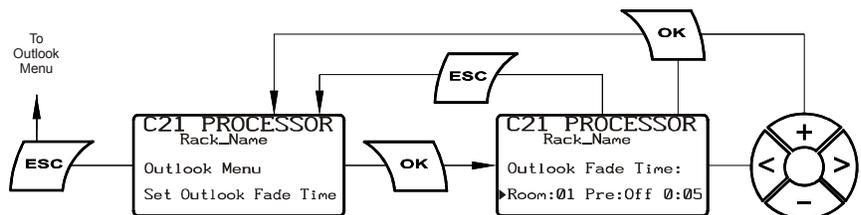
Set Fade Time Range   Set Fade Time Range (Feature currently not available).

Set Power-up Preset   Set Power-up Preset (Feature currently not available).

Review Outlook Patch   Review Outlook Patch


```
To                                                    OK
Outlook
Menu                              ESC

              C21 PROCESSOR              C21 PROCESSOR        +
              Rack_Name                  Rack_Name
ESC                               OK                      <   >
              Outlook Menu              Outlook Patch:
              Review Outlook Patch      Dimmers: 001-006      -
                                        Rm▸ -  -  -  -  -  -
                                        Ch▸ -  -  -  -  -  -
```

Set Outlook Patch   Set Outlook Patch
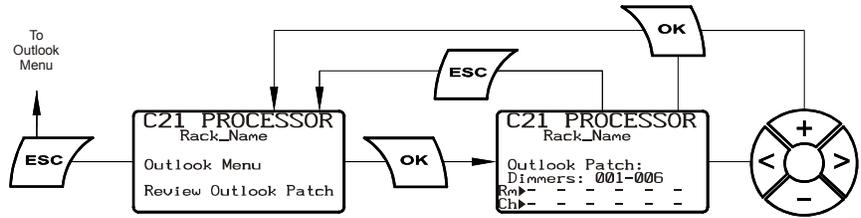

```
To                                                    OK
Outlook
Menu                              ESC

              C21 PROCESSOR              C21 PROCESSOR        +
              Rack_Name                  Rack_Name
ESC                               OK                      <   >
              Outlook Menu              Outlook Patch:
              Set Outlook Patch         Dim   Rm Ch Pri       -
                                        ▸001 = 01 01 00h
```
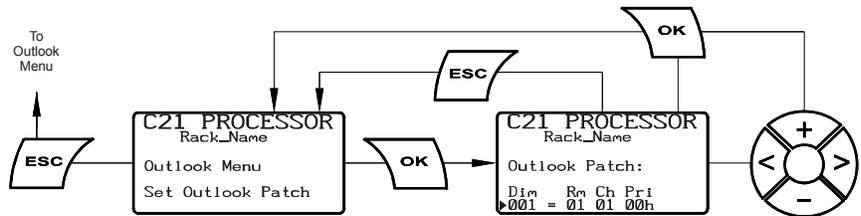
Local Control Menu   Local Control Menu


```
To Main Menu ◂          ESC        OK

                     C21 PROCESSOR
                       Rack_Name
From Main Menu ──  OK              <   >
                     To Local Control

                                  To Local Control
                                    Menu Items
```
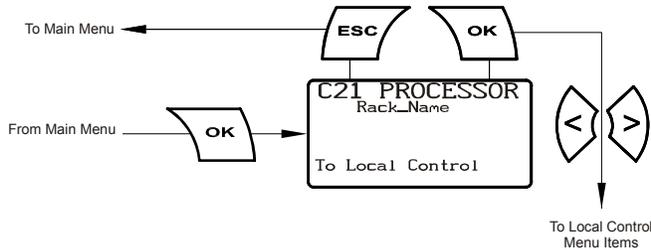
Set Dimmer level   Allows you to set an individual dimmer to INPUT or to a local level between 0% and FULL.

Note: Setting dimmer levels to something other than INPUT overrides the control inputs, including presets, you can easily loose control of dimmers by forgetting to set them back to INPUT. The levels set in this menu are remembered even when you shut down the rack.

You can use the Set Dimmer levels menu to set dimmer levels in order to record SWC and Outlook presets where there is no conventional lighting control system.


```
To                                                    OK
Local Control
Menu                              ESC

              C21 PROCESSOR              C21 PROCESSOR        +
              Rack_Name                  Rack_Name
ESC                               OK                      <   >
              Local Control Menu        Dimmer Level:
              Set Dimmer Level          ▸001 [Input] = 000%   -
```
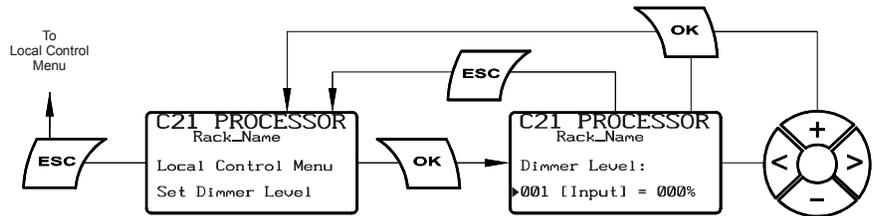
Set Dimmer Lev. Range   Allows you to set a range of dimmers to INPUT or to a local level between 0% and FULL.

Note: Setting dimmer levels to something other than INPUT overrides the control inputs, including presets, you can easily loose control of dimmers by forgetting to set them back to INPUT. The levels set in this menu are remembered even when you shut down the rack.

You can use the Set Dimmer levels menu to set dimmer levels in order to record SWC and Outlook presets where there is no conventional lighting control system.
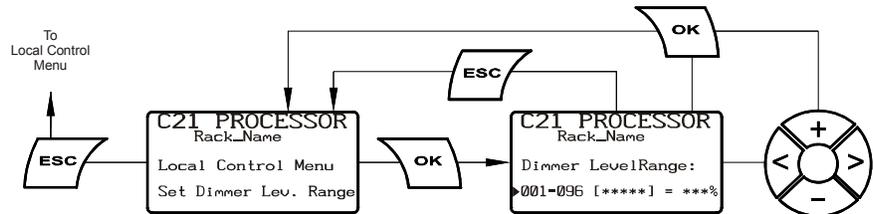
Call SWC Preset   Allows you to recall one of the 128 SWC presets.
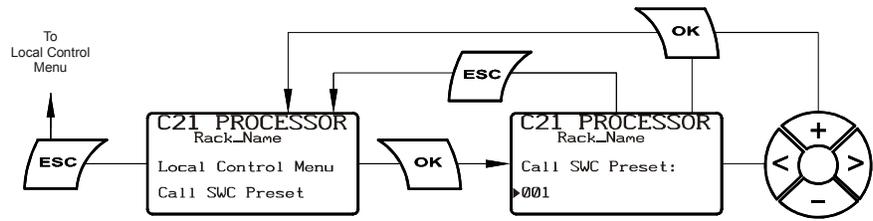
Call Outlook Preset   Allows you to recall an Outlook Preset in one of the 16 rooms.
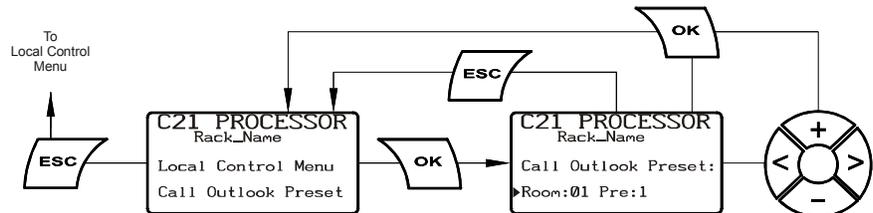
Status Reporting Menu

Status Reporting Menu
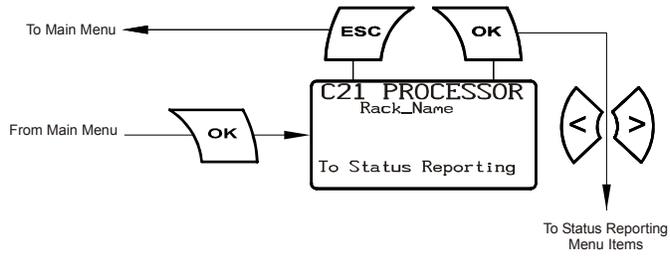
View Live Status

View Live Status
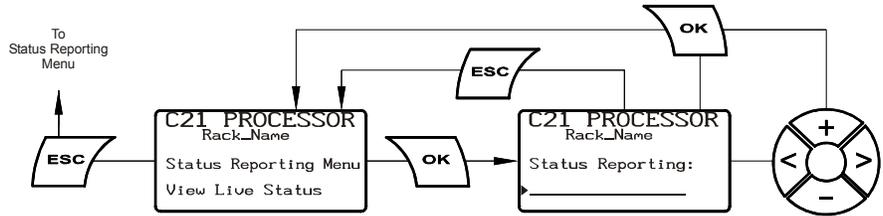
View Event Log

View Event Log
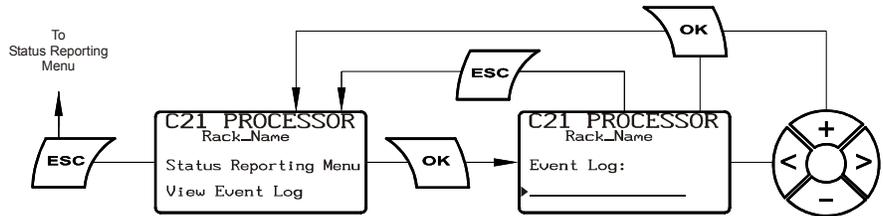
Learn Load Profiles

Learn Load Profiles
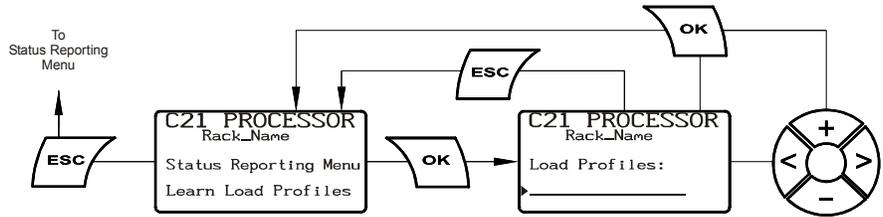
Enable Reports

Enable Reports
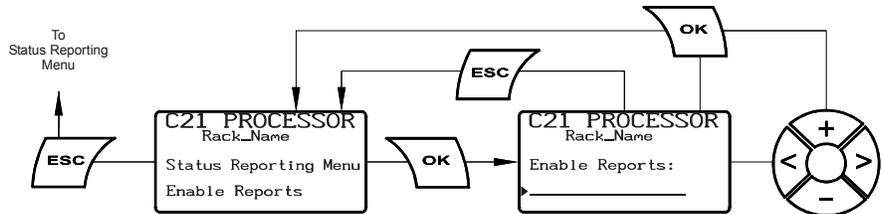
Set CB Trip Mode

Set CB Trip Mode

To
Status Reporting
Menu

ESC

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Status Reporting Menu
Set CB Trip Mode

OK

C21 PROCESSOR
Rack_Name
CB Trip Mode:
_____

+
< >
−
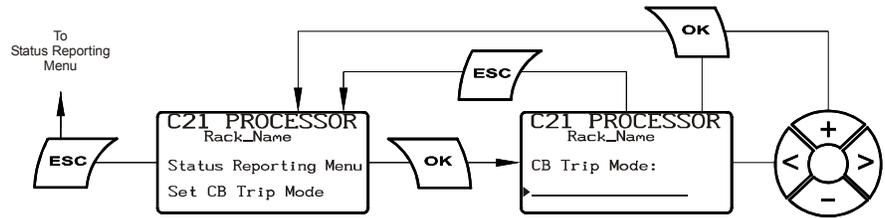
View Profile Stats

View Profile Stats

To
Status Reporting
Menu

ESC

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Status Reporting Menu
View Profile Stats

OK

C21 PROCESSOR
Rack_Name
Profile Stats:
_____

+
< >
−
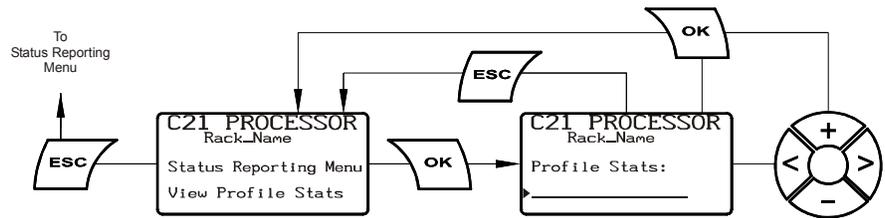
View Comm Stats

View Comm Stats

To
Status Reporting
Menu

ESC

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Status Reporting Menu
View Comm Stats

OK

C21 PROCESSOR
Rack_Name
Comm Stats:
_____

+
< >
−
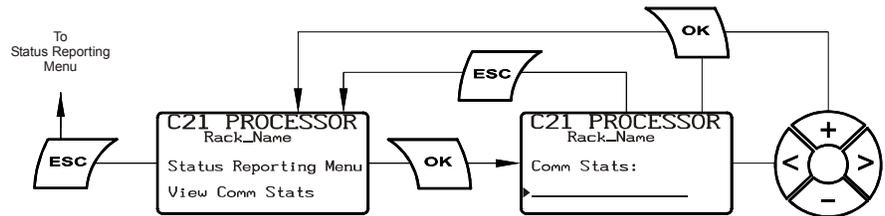
Set Event Config

Set Event Config

To
Status Reporting
Menu

ESC

OK

ESC

OK

C21 PROCESSOR
Rack_Name
Status Reporting Menu
Set Event Config

OK

C21 PROCESSOR
Rack_Name
Event Config:
_____

+
< >
−

Factory Menu

Factory Menu

To Main Menu ← ESC OK

From Main Menu — OK →

```
C21 PROCESSOR
   Rack_Name

To Factory Menu
```

< >

To Factory Menu
Items
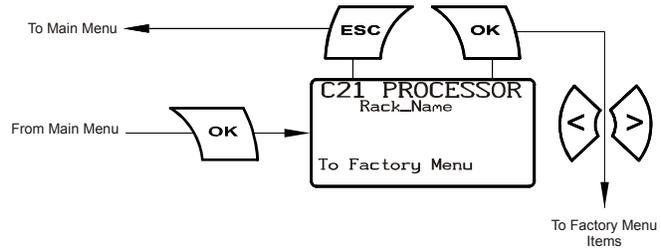
Set Rack Model

Allows you to choose which rack model the processor is connect.

Options:
C21/EC21

To
Factory
Menu

OK

ESC

ESC OK

```
C21 PROCESSOR
   Rack_Name

Factory Menu
Set Rack Model
```

OK →

```
C21 PROCESSOR
   Rack_Name

Rack Model:
▶C21
```

+ −

OK →

```
C21 PROCESSOR
   Rack_Name

Enter Password:
▶0000
```
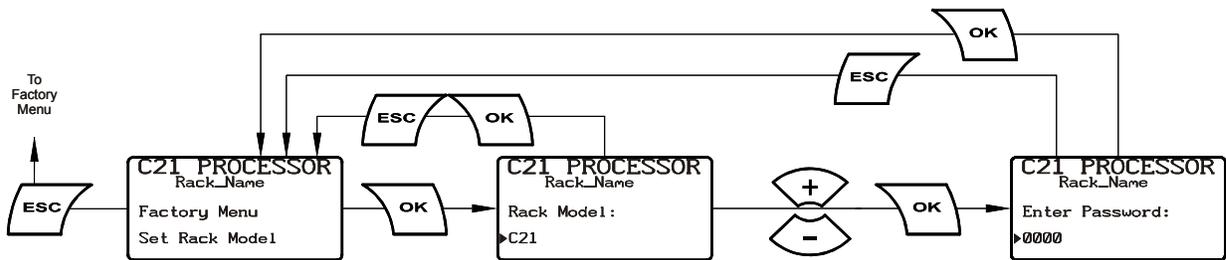
Set Rack Mains

Allows you set the rack mains for 120V or 230V markets

To
Factory
Menu

OK

ESC

ESC OK

```
C21 PROCESSOR
   Rack_Name

Factory Menu
Set Rack Mains
```

OK →

```
C21 PROCESSOR
   Rack_Name

Rack Mains:
▶90 - 140V
```

+ −

OK →

```
C21 PROCESSOR
   Rack_Name

Enter Password:
▶0000
```
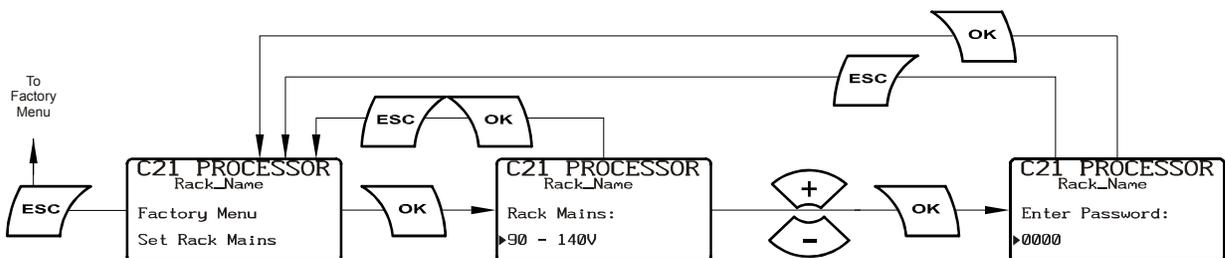
Set Phase Config   Allows you to set the rack phases for the 120V and 230V markets

The rack mains can be configured for 120V markets:
3-Phase: A-B-C-A-B-C or Single-Phase: A-A-A-C-C-C

The rack mains can be configured for 230V markets:
L1-L1-L2-L2-L3-L3
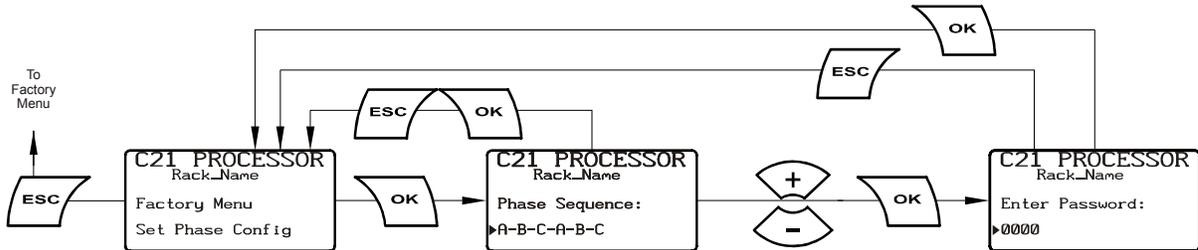
Set Rack Size   Allows you to select the quantity of slots available in the dimmer rack.

The options are: 6, 12, 24, 36 or 48 slots
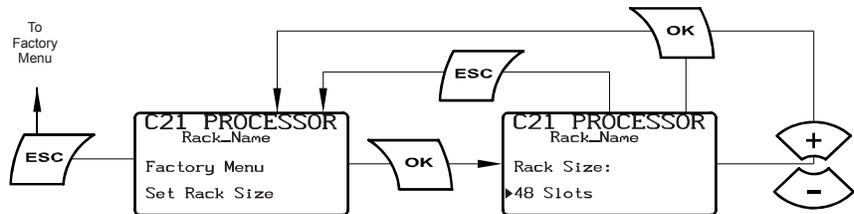
Set Rack Slot Order   Allows you to choose if the slots are numbered horizontally or vertically through the dimmer rack.

If this option is set to horizontal, then the slots are numbered from 1 to 6, left to right across the top row. The slots in the second row are numbered from 7 to 12 and so on down all 8 rows.

The option is set to vertical, then the slots are numbers from 1 to 8 down the first column. The slots in the second column are numbered from 9 to 16 and so on across all 6 columns.
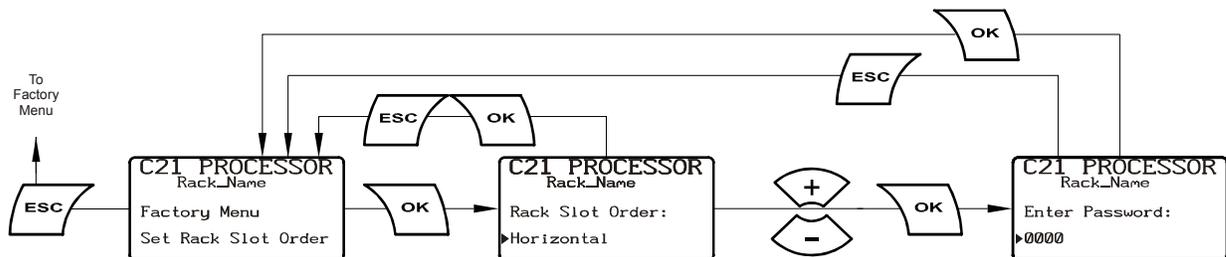
Set Rack Slot Usage   Allows you to select the type of dimmer module that will the plugged into a dimmer rack slot.

The options are: Unused, Single, Dual, Quad
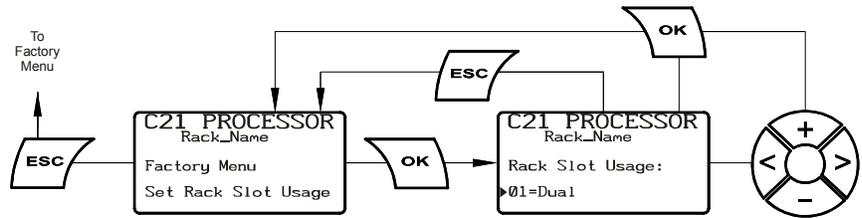
Set Phase Sense Trim   Allows you to set the amplifier gain for the line voltage sensing circuit. Generally this voltage is equal to the line input voltage for each phase. Adjusting the HEX value between 000 and 255 sets the voltage level.
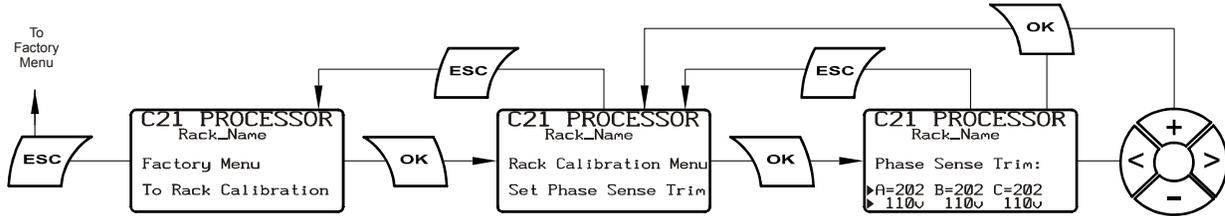
Set Phase Filters   Allows you to set the width of the zero cross blanking period.

This function ensures that the processor module zero crossover time is synchronized with the mains. You must not activate this while a control signal is connected.

Note: Do not calibrate the Phase Filters unless specifically advised to do so by a representative of Strand Lighting.
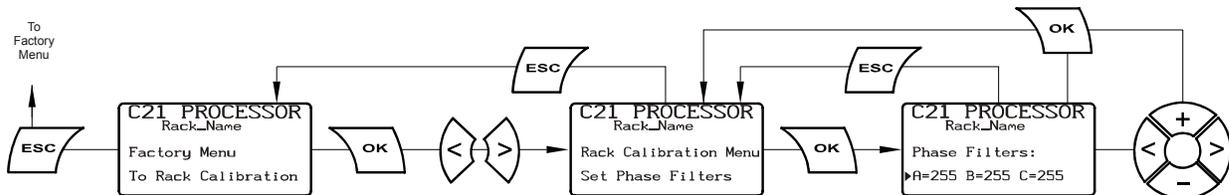
Set Serial Number   Allows the factory to enter the serial number during initialization of theC21/EC21processor.
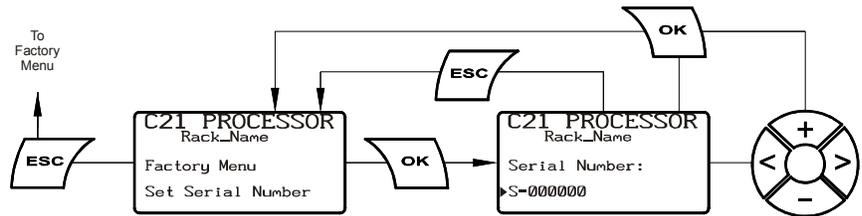
Set Language   Allows you to select the display language.
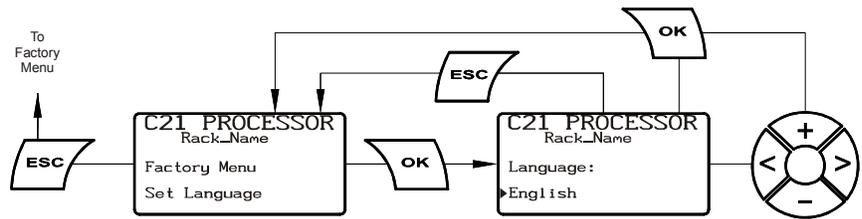
Set MAC Address   Allows the factory to enter the six octets of the MAC address (in hexadecimal) during initialization of the C21/EC21 processor.
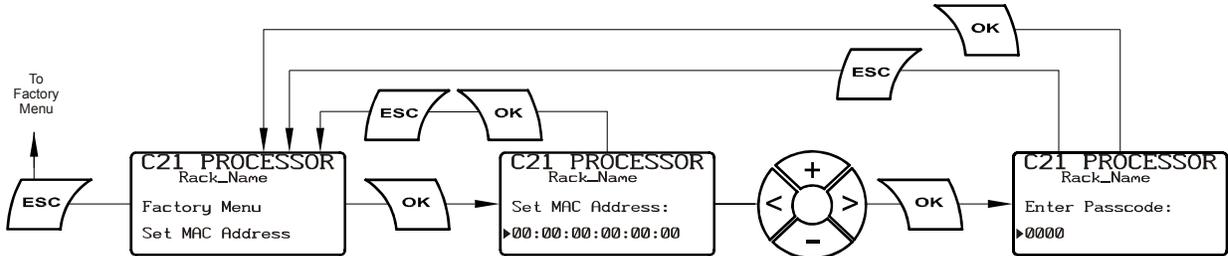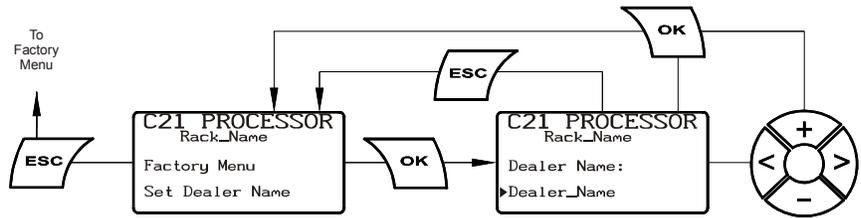

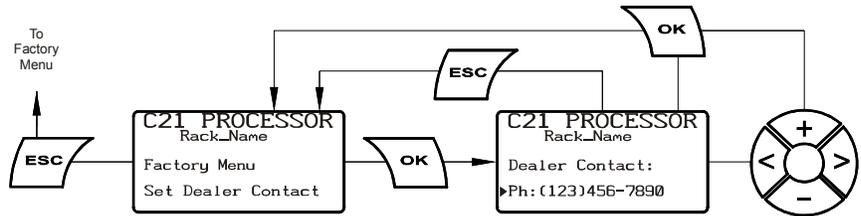**Set Project Name**   Allows you to edit the Project name text field. This name is different than the one created in the *Network Config Menu* and is not viewed by the network.
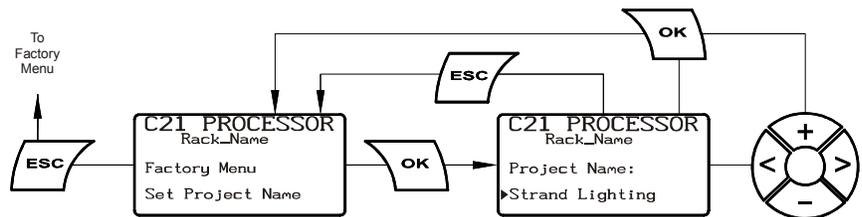
Set Dealer Name
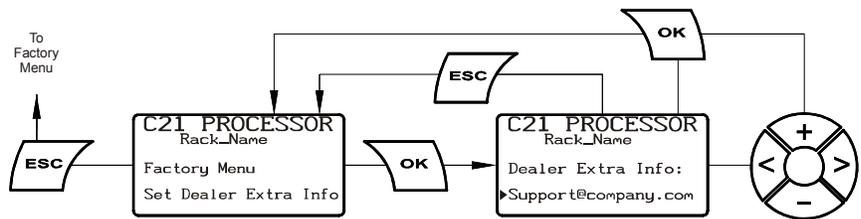
Allows you to edit the Dealer Name text field.

Set Dealer Contact
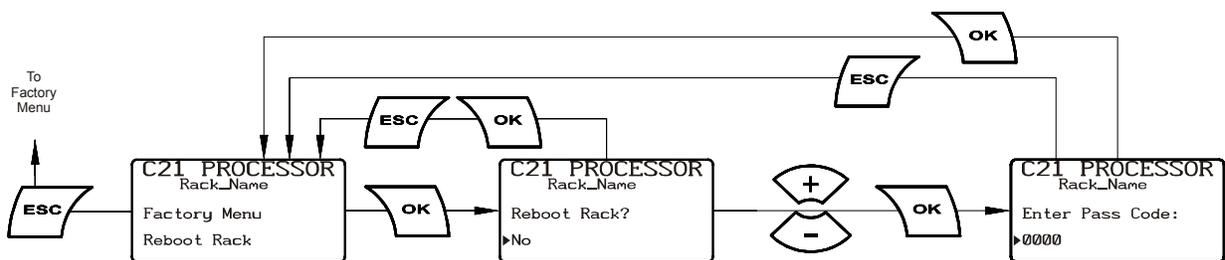
Allows you to edit the Dealer Contact text field.

Set Dealer Extra Info.

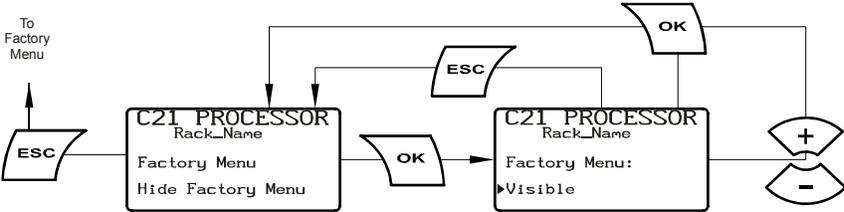Allows you to edit the Dealer Extra Info text field.

Reboot Rack

Allows you to force a soft re-boot of the C21/EC21 operating system.

Hide Factory Menu   Allows you to hide this menu.

Note: Selecting this option requires a special key sequence to un-hide the *Factory Menu* once it has been hidden.

Section 4 - Basic Troubleshooting

General   This section provides basic troubleshooting procedures for C21/EC21 series dimmer racks. It does not provide comprehensive maintenance data, but lets you solve simple problems and helps Strand Lighting with initial data when these procedures are not effective.

For best system operation, do a routine check and cleaning once per year unless the operating environment is unusually harsh or dirty. Please consult Strand Lighting Field Service if you are in doubt about the frequency of maintenance required for your system. Service and maintenance operations other than routine checks and cleaning are seldom required. In case of problems, and in order to save time, follow the procedures outlined in this section before calling Strand Lighting. Take note of the results of each step, as you will be asked this information if you call a Strand Lighting service representative. In order to avoid miscommunication, ensure that the person contacting Strand Lighting is the person doing the tests. All servicing except dimmer and mechanical components should be performed by sub-assembly replacement.

Control Signal Flow   The following diagram illustrates the control signal flow through the dimmer rack. It is included to show how the programmable settings interrelate.

Figure 8 - Control Signal Flow