



SmartLED™ MRI Lighting System

The Turn-Key Solution for Safe Illumination in MRI Spaces

www.kirlinlighting.com

Lighting in the MRI Suite

MRI suites contain very powerful magnets used to generate diagnostic images of soft tissue. Because of this, they require illumination that will not affect, or be affected by, the magnetic field in the room.

Having adequate light levels in the room helps ensure safe handling of the patient. IES recommends **5 fc** during the scan, **30 fc** ambient for movement, and cleaning purposes, and **75 fc** at the patient transfer table for preparation as well as any emergencies that may arise.

Because patients are typically awake, having dimmable lighting is a must. Adding decorative or distracting lighting elements can help keep their minds off the scan being done.



Key Requirements of Lighting an MRI Suite

- 1. DC Power Only** - AC power, or alternating current, has been known to cause RF interference and can distort images. Direct current, on the other hand, does not switch magnetic polarities, and therefore creates a “clean” power source that doesn’t disrupt the MRI’s ability to create detailed tissue images.
- 2. Non-Ferromagnetic Materials** - As the magnets in MRIs get stronger and stronger, the need for non-ferrous material, even in the smallest screw or fastener, becomes even more critical for the safe and effective operation of these amazing machines. Non-ferromagnetic materials include copper, aluminum, beryllium, and zinc.
- 3. Space Must be Shielded** - MRI machines rely on magnetic fields and radio waves. Scanner rooms are completely enclosed in a full metal shield, commonly made of copper. This shield prevents stray radio frequency or electromagnetic noise from elsewhere in the hospital from entering the room and affecting the scan, and it also protects the rest of the equipment in the hospital from the very powerful magnetic field produced by the machine.
- 4. Proper Filtering of All Openings** - Any opening in the shield, including doors and windows, must be filtered to block EMI or RFI from entering the suite. Electrical wires make excellent antennae for bringing emissions into the suite and therefore must also be filtered as they enter the scanner room.

The SmartLED™ System

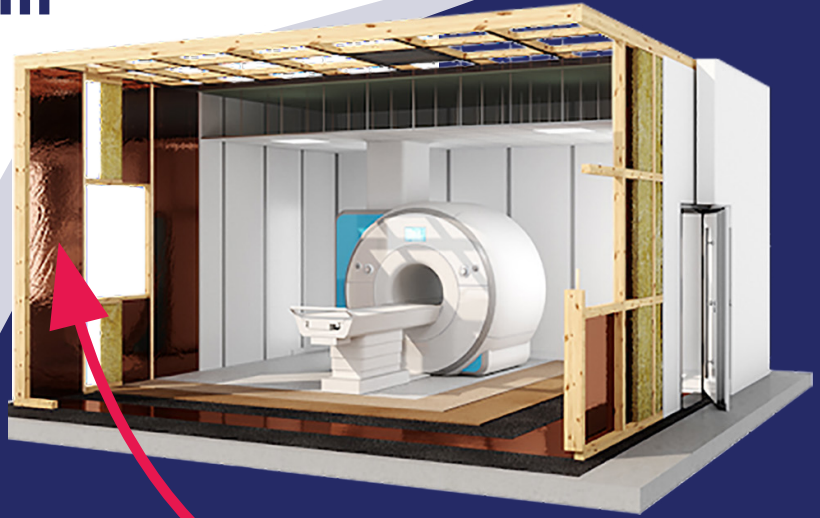
Kirlin's 4-part solution for MRI lighting includes all the components needed to safely illuminate any MRI environment:

**MRI-Safe
Luminaires**

**Remote-Mounted
Drivers and Cabinet**

**RFI/EMI
Filters**

**Emergency Power
Inverters**



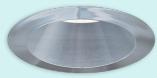
Full Copper Shielding

Full Copper Shielding is used to create a "Faraday cage" which prevents electromagnetic interference from distorting MRI images, and protects nearby medical equipment from being affected by the MRI machine.



SmartLED™ System Components

MRI-Safe **Luminaires**



4" Round

Downlight • Adjustable • Wall Wash
Static White • RGBW



MRI Luminaire Family



6" Round

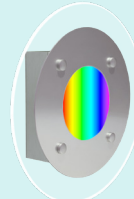
Downlight • Adjustable • Wall Wash
Static White • RGBW



12" x 4" Cylinder

Static White • RGBW

Wall **Sconces**



Round

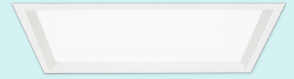
Static White • RGBW



Square

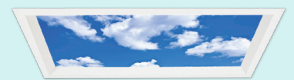
Static White • RGBW

2' x 2' **Panels**



White

Static White



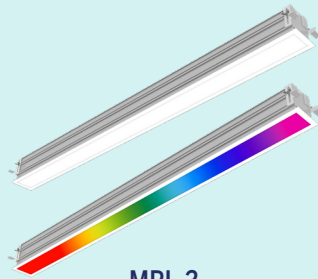
Scenic

Static White



7" & 8" Round

IP65 Downlight
Static White • RGBW



MRL-2

Static White • RGBW



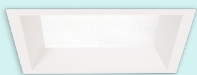
MRI Configurator



Scenic Panel Configurator

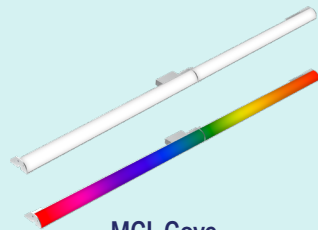


Scenic Panel Options



4" & 6" Square

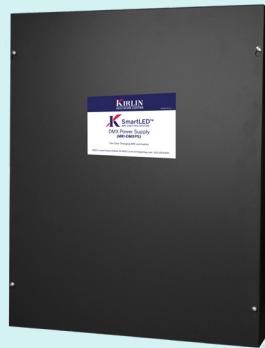
Downlight
Static White • RGBW



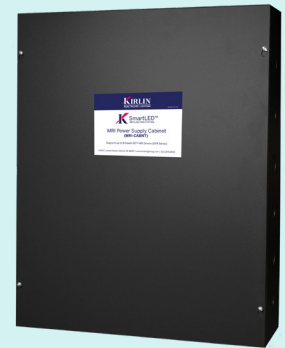
MCL Cove

Static White • RGBW

Remoted-Mounted Driver **Cabinets**



MRI-DMXPS



MRI-CABNT

RGBW DMX System **Components**



PDB-04

Plug-in Distribution Box



MRI-DMXWP



Undercabinet

Static White

Emergency Power **Inverters**



EMI-21220



EMI-03120

RFI/EMI **Filters**



RFI-3100D



RFI-4100D

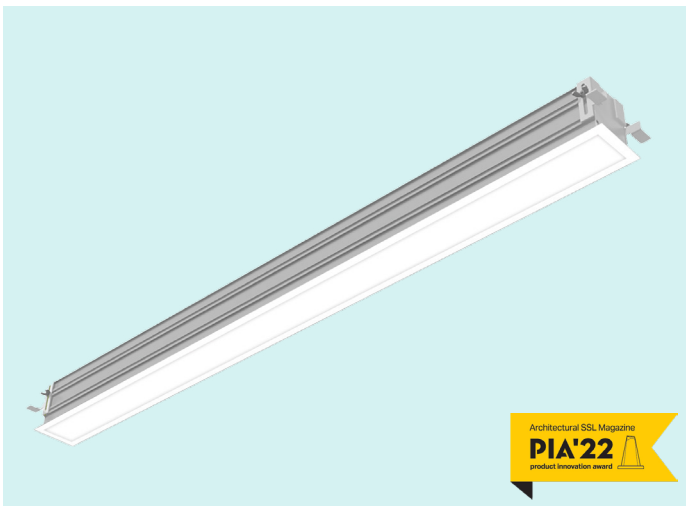
Product Spotlight

MRL-2

A full-feature 2.5" slot luminaire designed for the requirements and needs of the MRI suite. Available in standard lengths from 2-12 ft, MRL-2 is supplied with all necessary MRI components for issue-free installation.

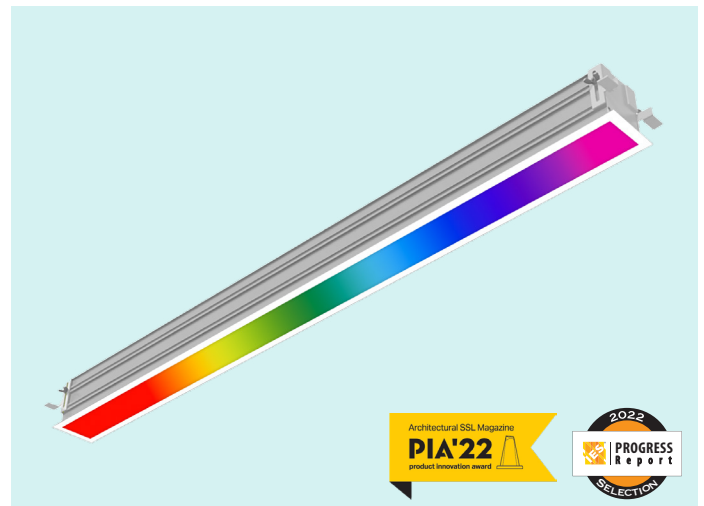
MRL-2 SWM provides high quality static white illumination with either a direct or asymmetric distribution for optimal photometric performance.

MRL-2 CCM utilizes a RGBW quad chip that provides a rich color palette for full spectrum expression that can be changed at any time, even during a scan.



Static White: **MRL-02SWM**

- Delivers up to 800 lm/ft with 90+ CRI in 3000K, 3500K, and 4000K
- Remote power can be seamlessly combined with other static white Kirlin SmartLED™ MRI products



Dynamic Color: **MRL-02CCM**

- Supplied with Kirlin's DMX Power Supply and 4-Channel RGBW RFI/EMI Filter
- Plug-and-play RJ45-style wiring from RGBW Filter output to Fixture input

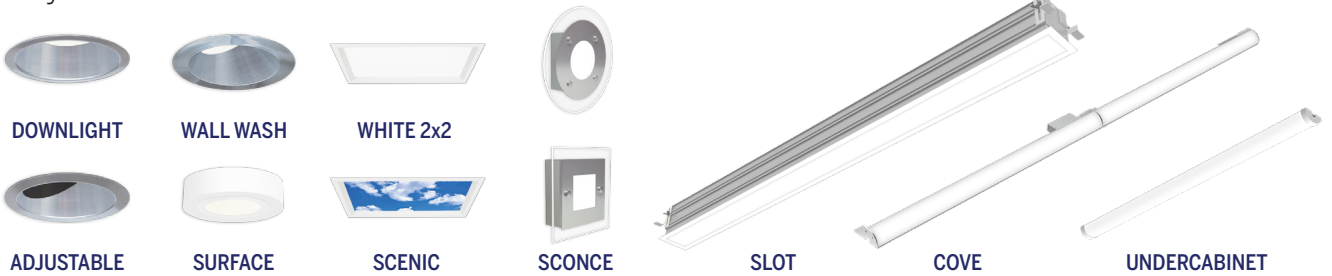
MRI Static White Specification Checklist

Or use Kirlin's MRI Configurator at www.kirlinlighting.com/mri-configurator.

1

Select **Luminaires**

To achieve the desired light levels and design aesthetic in the Scanner Room, select from Kirlin's broad array of MRI-safe fixtures.



2

Add Up Total Number of **Driver Modules** Needed



See product specification sheets for quantity and type(s) of drivers needed. Add up the total number of drivers required based on the room's lighting layout.

3

Determine the Number of Driver **Cabinets** Needed



This one is easy. Each cabinet holds up to **8** driver modules of either type.

4

Determine the Number of SmartLED™ **Filters** Needed



5

Select Desired **0-10V Dimming** Controls

Caution: Remember to mount dimming controls outside MRI shield.

For compatible systems, see [MRI-CABNT](#) spec sheet.



MRI-CABNT

6

Add Emergency Power **Inverters** (Optional)



EMI-21220

Provides 2+ hours of power for up to **8** modules.



EMI-03120

Provides 2+ hours of power for up to **3** modules.

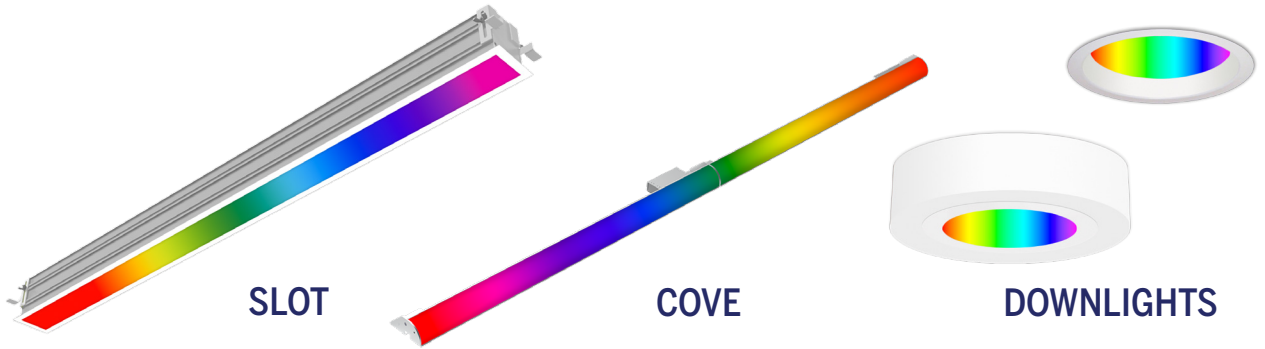
MRI Dynamic Color Specification Checklist

Or use Kirlin's MRI Configurator at www.kirlinlighting.com/mri-configurator.

1

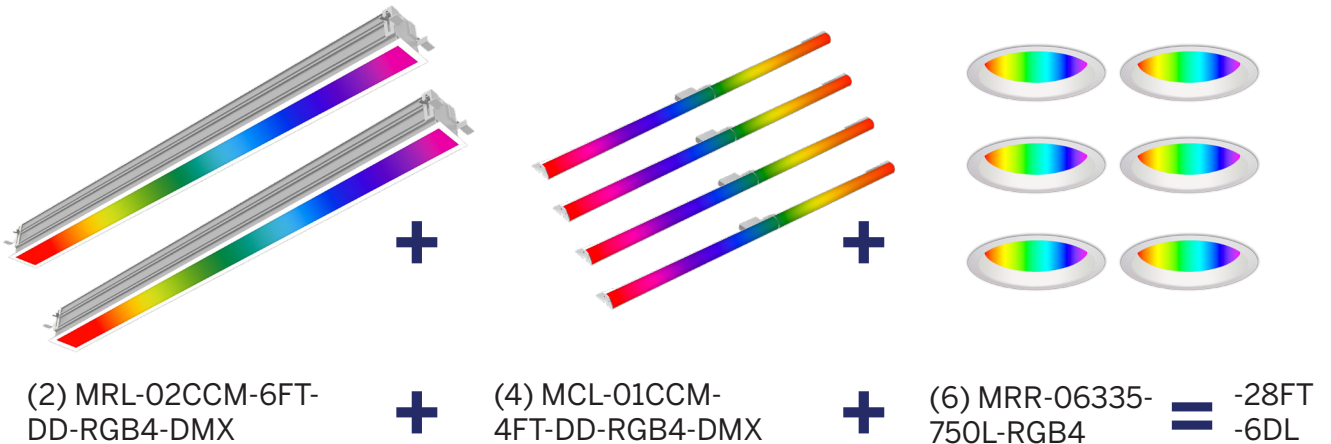
Select Luminaires

To create a patient-centric MRI experience with soothing, dynamic color scenes, choose from Kirlin's RGBW Recessed Linear Slot Light, RGBW Cove Light, or from 15 RGBW Downlights, Cylinders and Sconces.



2

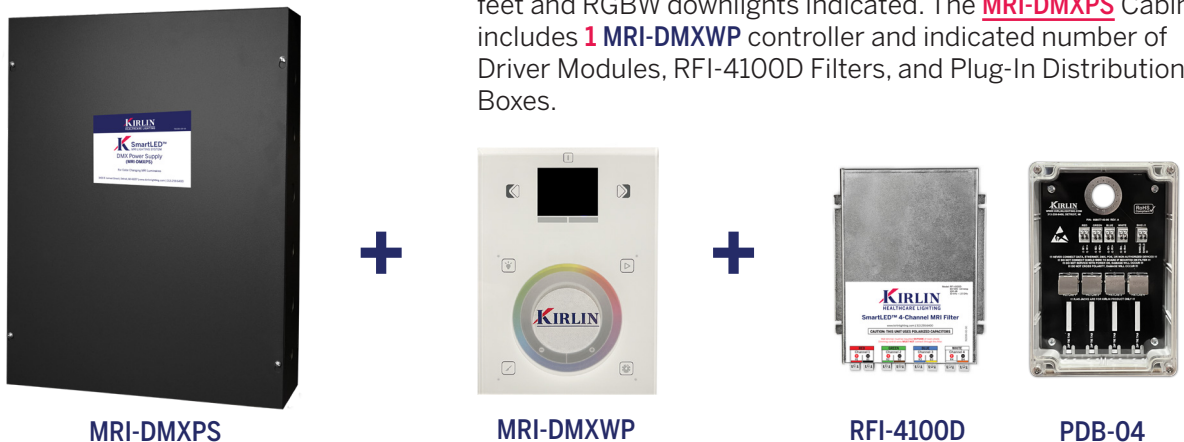
Calculate the Total Feet of RGBW **Fixture Length** Per Room and the total number of RGBW **Downlights** Per Room.



3

Order MRI-DMXPS Cabinet

Specify MRI-DMXPS-XXFT-XXDL, with the total RGBW linear feet and RGBW downlights indicated. The **MRI-DMXPS** Cabinet includes **1 MRI-DMXWP** controller and indicated number of Driver Modules, RFI-4100D Filters, and Plug-In Distribution Boxes.





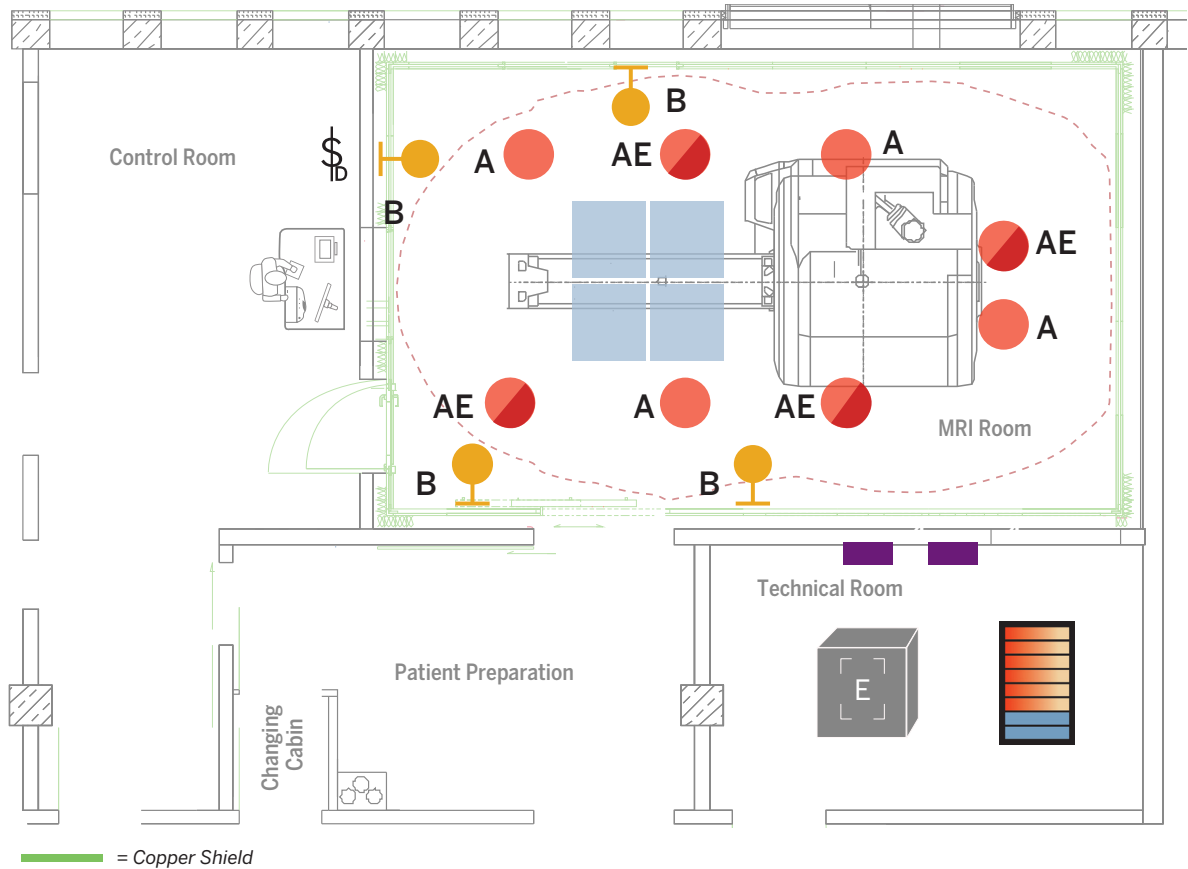
MRI Room

CareMount Medical Imaging Center, Poughkeepsie, NY
Specifier: Whitman Engineering
Products: MRP-22290, MRR-06420, DVR-1400A,
DVR-0700A, RFI-3100D, MRI-CABNT



Control Room

Sample Room Layout



Lighting Fixture Schedule

QTY	Type	Manufact. & Model No.	Desc.	Lumens, CCT, CRI	Watts	Volts	Notes		
4	A	Kirlin Lighting MRR-06205-1500L-HC	6" Recessed Downlights	LED, 1500L, 3500K, 90 CRI	20	120-277V		1500L Open Appearance Downlights	
4	AE	Kirlin Lighting MRR-06205-1500L-HC	6" Recessed Downlights (Emergency)	LED, 1500L, 3500K, 90 CRI	20	120-277V		1500L Open Appearance Downlights connected to Emergency Inverter	
4	B	Kirlin Lighting MSR-14250	Wall Sconces	LED, 3500K	15	120-277V		Round Surface Mount Decorative Sconces	
1	C	Kirlin Lighting MRP-22290-120-4x4-A01	4' x 4' Scenic Panel Array (4 Panels)	LED, Back-Lit Cloud Image	20	120-277V		2' x 2' Scenic Panel Luminaires	
6	A-PS B-PS	Kirlin Lighting DVR-1400A	Remote Mounted Driver Modules		50	120-277V		Provides power and dimming control (four to power eight downlights; two to power four wall sconces)	
2	C-PS	Kirlin Lighting DVR-0700A	Remote Mounted Driver Modules		50	120-277V		Provides power and dimming control (to power four panels)	
1		Kirlin Lighting MRI-CABNT	Driver Cabinet					24" x 18" x 4.5" carbon steel enclosure (to house eight driver modules)	
2		Kirlin Lighting RFI-4100D	4 Channel EMI/RFI Filters					Removes RFI/EMI noise from circuits entering the MRI suite (8 channels, one per driver module)	
1		Kirlin Lighting EMI-03120	Emergency Backup System Inverter		125	120-277V		Emergency power for up to three driver modules	

Product Spotlight

MCL Cove

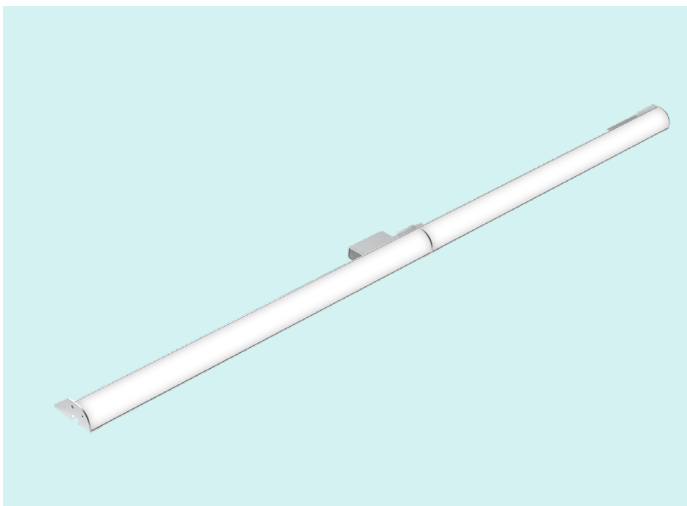
Kirlin's MCL Cove light is the latest addition to the SmartLED™ MRI family of products. It's available in 2- and 4-foot lengths and uses the same components as the rest of the line.

At less than 1.5" high, the MCL can easily tuck away into any cove, including premade cove solutions.

Like all of Kirlin's MRI solutions, the MCL's ability to dim to 0.4% give practitioners the ability to lower the light levels while the scan is in progress.

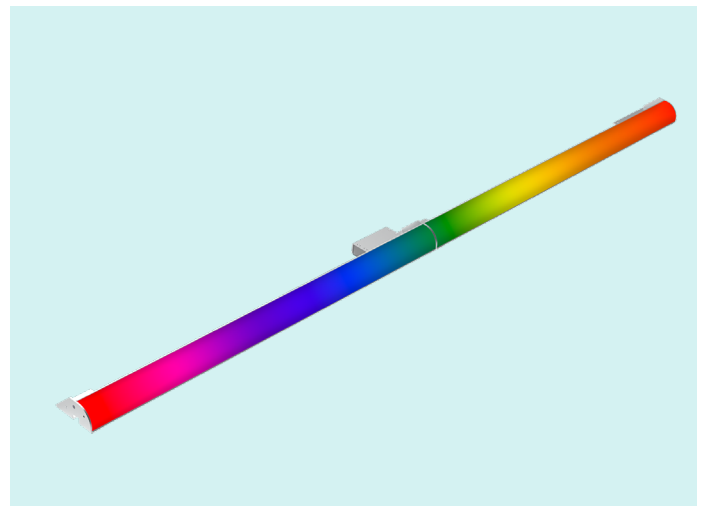


*David Koch Center at NewYork-Presbyterian Hospital, New York, NY
Specifier: Julie Donovan, HOK; Photo Credit: James Ewing
Products: MRR-06420, DVR-1400A, RFI-3100D, MRI-CABNT*



Static White: [MCL-01SWM](#)

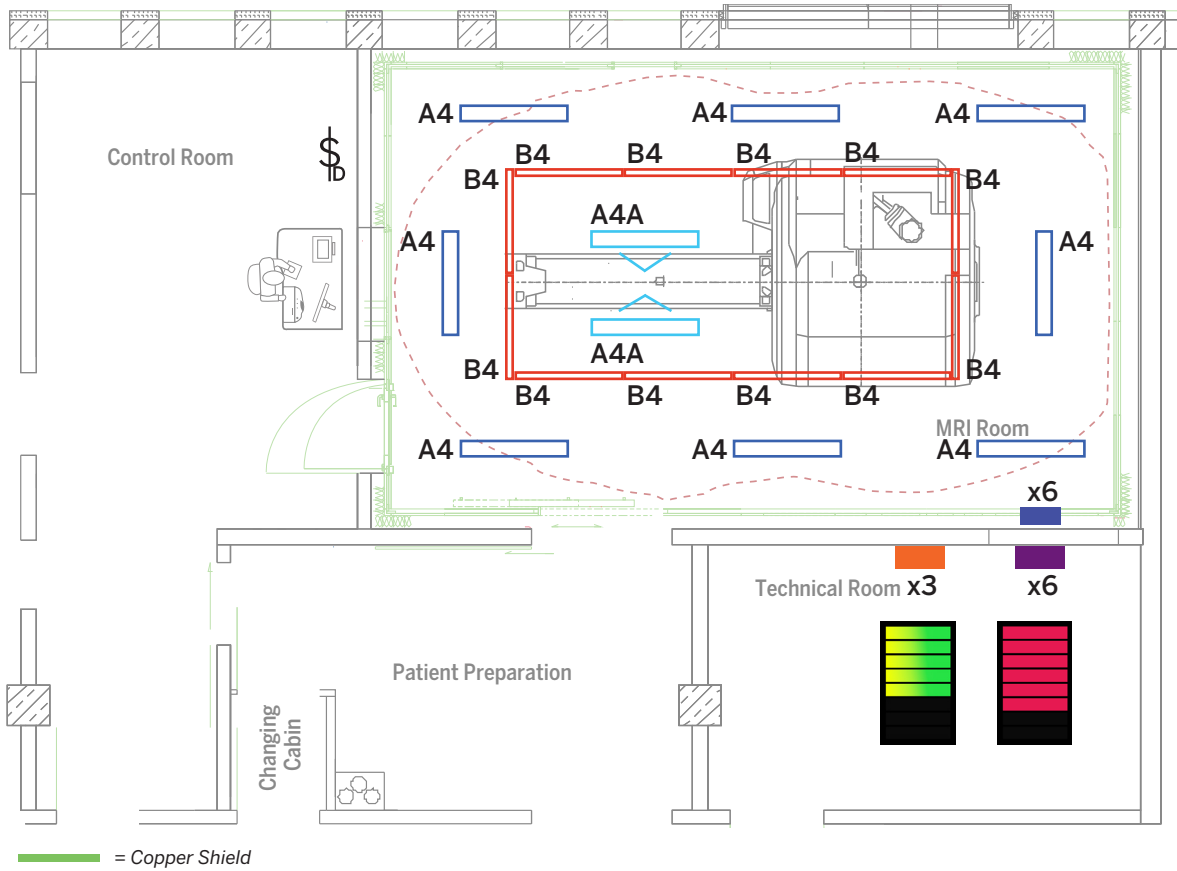
- Delivers 90+ CRI light at a fixed 45 degree angle in 3000K, 3500K, and 4000K
- Remote power can be seamlessly combined with other static white Kirlin SmartLED™ MRI products



Dynamic Color: [MCL-01CCM](#)

- Supplied with Kirlin's DMX Power Supply and 4-Channel RGBW RFI/EMI Filter
- Plug-and-play RJ45-style wiring from RGBW Filter output to Fixture input

Sample Room Linear Fixture Layout



Lighting Fixture Schedule

QTY	Type	Manufact. & Model No.	Desc.	CCT, CRI	Watts	Volts		Notes	
8	A4	Kirlin Lighting MRL-02SWM-4FT-DD-40K-BG	2.5" Recessed Linear Slot Light - Direct - 4'	LED, 4000K 90+ CRI	33W	120-277V		2.5" Recessed Linear Slot Light - Direct Distribution - 4 foot length	
2	A4A	Kirlin Lighting MRL-02SWM-4FT-AS-40K-BG	2.5" Recessed Linear Slot Light - Asymmetric - 4'	LED, 4000K 90+ CRI	33W	120-277V		2.5" Recessed Linear Slot Light - Asymmetric Distribution - 4 foot length	
12	B4	Kirlin Lighting MCL-01CCM-4FT-DD-RGB4-DMX	RGBW Color-Changing Cove Light - 4'	LED, RGB + 4000K 80+ CRI	24W	120-277V		1.5" RGBW Color-Changing Cove Light - 4 foot length	
5	A4-PS A4A-PS	Kirlin Lighting DVR-1400B	Remote Mounted Driver Modules		75W	120-277V		Provides power and dimming control (four to power 32 ft of A4; one to power 8ft of A4A)	
1		Kirlin Lighting MRI-CABNT	0-10V Driver Cabinet					24" x 18" x 4.5" carbon steel enclosure (to house five DVR-1400B driver modules)	
2		Kirlin Lighting RFI-3100D	DC MRI Filter					Removes RFI/EMI from electrical circuits entering the MRI suite (3 channels, one per 0-10V driver module)	
1		Kirlin Lighting MRI-DMXPS-48FT	DMX Driver Cabinet and Drivers		50W/driver	120-277V		24" x 18" x 4.5" carbon steel enclosure (includes six DMX drivers, six 4 channel filters, six PDB-04, one MRI-DMXWP DMX controller)	
6		Kirlin Lighting RFI-4100D	DC MRI Filter					Removes RFI/EMI from electrical circuits entering the MRI suite (One filter per driver module)	
6		Kirlin Lighting PDB-04	Plug-In Power Distribution Box					Allows power and RGBW DMX signal to be delivered into the MRI suite (One PDB per filter)	

*Front Cover:
New York Presbyterian MRI, New York, NY
Specifier: HOK
Products: MRR-06420 & MRI-CABNT*

