

CARBONITE

Carbonite Black Solo Configuration Guide

v2.0

Document Information

- Ross Part Number: **4840DR-100-02.0A**
- Release Date: December, 2021. Printed in Canada

The information contained in this document is subject to change without notice or obligation.

Copyright

©2020 Ross Video Limited, Ross[®], CrossOver[®], MiniME[™], and any related marks are trademarks or registered trademarks of Ross Video Limited. All other trademarks are the property of their respective companies. PATENTS ISSUED and PENDING. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, mechanical, photocopying, recording or otherwise, without the prior written permission of Ross Video. While every precaution has been taken in the preparation of this document, Ross Video assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein.

Microsoft[®], Windows[®], and Windows XP[®] are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

NVIDIA[®] and GeForce[®] are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and/or other countries.

Patents

Patent numbers US 7,034,886; US 7,508,455; US 7,602,446; US 7,802,802 B2; US 7,834,886; US 7,914,332; US 8,307,284; US 8,407,374 B2; US 8,499,019 B2; US 8,519,949 B2; US 8,743,292 B2; US D752,530 S; GB 2,419,119 B; GB 2,447,380 B; and other patents pending.

Contents

Extended Warranty.....	14
Specifications.....	15
Switcher Resources.....	15
Hardware Weights.....	15
Environmental Characteristics.....	15
Video Input Specifications.....	15
Video Output Specifications.....	15
Audio Specifications.....	16
Jitter.....	16
System Timing.....	16
Power Consumption.....	16
Option Summary.....	17
Dimensions.....	18
Carbonite Black Solo (CB-SOLO/CB-SOLO-13/CB9).....	18
Carbonite Black Solo Frame (CBF-109/CBF-113).....	18
What's New!.....	5
v2.0 Features.....	5
Clip Player.....	5
Chroma Key Alpha Output.....	5
Features.....	6
Clean Feed Output.....	6
Custom Controls.....	6
Device Control.....	6
DVE (Fly Key).....	6
Effects Dissolve.....	6
Frame Sync and Format Conversion.....	6
General Purpose Interface (GPI).....	7
LiveEDL.....	7
Matte/Wash Generator.....	7
ME Effect System.....	7
Media-Store.....	7
MediaManager.....	7
MediaWipe.....	7
Clip Player.....	7
MemoryAI Recall Mode.....	7
Memory System.....	7
MiniME™.....	8
MultiScreen.....	8
MultiViewer.....	8
Pattern and Matte/Wash Generators.....	8
Tally Outputs.....	8
UltraChrome.....	8
XPression Live CG.....	8
Product Comparison.....	10
Carbonite Black Solo Frame.....	10
Standard System.....	11
System Options.....	12
XPression Live CG (XDS0-0001-CPS).....	12
Redundant Power.....	12
Remote Panels.....	12
DashBoard Display (CBPS-DashMenu).....	12
Panel Mounting Options.....	12
SMC-9901 Serial to MIDI Converter (SMC-9901).....	12
TSC-9902 Linear Timecode to Serial Converter (TSC-9902).....	13
SHC-9642 SDI to HDMI Converter (SHC-9642).....	13
Onsite Operational Training (CARBONITE-OTR-1DAY).....	13
Online Operational Training (CARBONITE-ONL-1DAY).....	13
Onsite Technical Training (CARBONITE-OTT-1DAY).....	13
Onsite Commissioning (CARBONITE-COM-1DAY).....	14

Carbonite

Designed for Live!

Carbonite Black Solo builds on the highly successful CrossOver® Solo by bringing the power and advanced features of the Carbonite Black series into the classic all-in-one form factor.

Designed for Linear!

The Carbonite family of switchers continues to build on Ross® Video's reputation for setting the standard for multi-definition linear editing suites. The traditional layout and familiar controls of other Ross® switchers provide the power and ease of use you have come to expect.

Carbonite cleanly connects to virtually any editor using the industry standard GVG100/110 protocols.

Designed for You!

With Ross® Video products installed in well over 125 countries world-wide, our sales, demonstration, and training people get a lot of ongoing feedback from customers. This feedback is carefully tracked and considered in the design and feature-set development of our products. Key members of the design teams are part of an ongoing program in which they provide product demonstrations, assist with product installation, and train operators. As a result, the complete line of Ross Video products continues to offer our legendary combination of power and ease of use.

Join our Growing Customer Base!

Deciding to purchase a Carbonite switcher will put you in good company, with many thousands of Ross switchers installed worldwide. Carbonite continues to build on a family of multi-definition switchers that have been delivering the goods every day in live sports, stadium scoreboards, and drama productions, mobile productions, as well as local and network newscasts.

Experience Great Support!

Ross® has designed and manufactured production switchers for over 40 years, with significant year over year growth for the past 20 years. We believe that an important factor

of our success is our focus on providing a superior customer experience. We continually benchmark our warranty and technical support to ensure that they are the best in the industry.

We hope that you join the many thousands of satisfied video professionals around the world that are proud owners of Ross® production switchers. Please do not hesitate to contact us with any questions or comments you have related to this Configuration Guide at Tel: +1-613-652-4886, Fax: +1-613-652-4425 or email us at solutions@rossvideo.com.

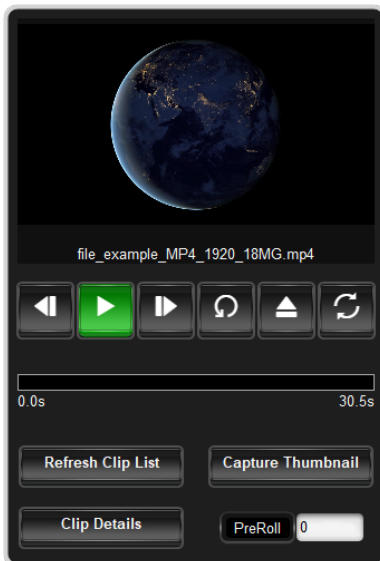
What's New!

We are all very proud of the many new features that have been packed into this release of the Carbonite software. Here is a list of some of the feature we are sure you will be interested in!

v2.0 Features

Clip Player

An integrated clip player with a single channel of playout has been added to the switcher. The clip player offers a single playout channel for compressed MPEG-4 AVC (ITU-T H.264) that can be assigned as a source on any bus in the switcher. Basic transport controls can be performed manually from the **Clip Player** page, using custom controls, or through AMP commands.



Chroma Key Alpha Output

The **MMCKAX** source has been added to the list of sources that can be assigned to an output. The MiniME™ Chroma Key Alpha output is the alpha output of the chroma key selected on key 2 of MiniME™ X. If the MiniME™ key is not a chroma key, the output is black.

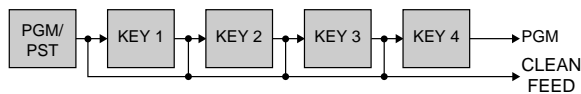
Features

Thank you for your interest in the Ross® Carbonite Black Solo switcher. The Carbonite Black Solo builds on the Ross® reputation for designing switchers that fit the needs of any production environment.

Clean Feed Output

Clean feed is typically used for bilingual and live-to-tape productions. It provides a second Program output that is derived from a different location than the standard program output. A frequent application is the recording of shows for later airing without call-in phone numbers inserted.

The clean feed output can come from before or between the keyers.



Custom Controls

This feature brings the power of macros to the switcher operator. Button presses, menu selections, event commands, or even the switcher state can be recorded to a custom control with pauses or holds between the events. A simple button press can play these events back again. Step through complex show openings as easily as pressing Custom Control buttons 1, 2, then 3.

Device Control

The switcher can control a number of external devices, such as video servers and robotic cameras. For a complete list of supported devices, and information on how to set up and control these devices, visit the Ross Video website

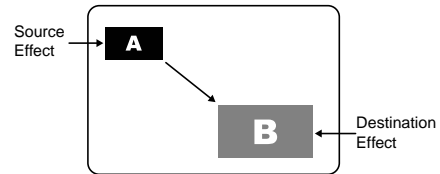
rossvideo.com/production-switchers/carbonite/interface-list.

DVE (Fly Key)

The advanced 2D DVE comes standard with each switcher, and can be used for performing over the shoulder, or picture in picture shots. This allows all key types to be zoomed, cropped, and repositioned horizontally and vertically to create the look you want, or you can use one of the useful pre-built 2D effects to perform 2D background transitions.

Effects Dissolve

The Effects Dissolve feature allows you to interpolate from one memory to another using a memory recall. The switcher will interpolate from the starting memory to the destination memory, creating a smooth, two key frame effect.



Only elements such as clip level and pattern position can be interpolated in the effects dissolve. Other elements, such as crosspoint selection, pattern, and next transition data are recalled first, and then the switcher will slew to the recalled memory.

An effects dissolve can be performed on as many elements and MEs as required, based on the memory that is being recalled.

Frame Sync and Format Conversion

The switcher has multiple input frame synchronizer / format converter (FSFC) and input de-interlacers that can be used to convert video input signals to the format that the switcher is operating in, as well as correct mistimed, or drifting, video input signal. The frame synchronizers cannot completely correct badly formatted video, mistimed switches, signal drops, or similar issues.

Each FSFC channel maintains a separate setting for different video formats. This lets you change between video formats without losing FSFC channel configurations.

The switcher has 6 FSFC channels that can be assigned to any input, and 4 additional frame syncs from the Media-Store (MSFS). Each Media-Store channel can be converted to a frame sync and assigned to an input, this removes the Media-Store functionality.

Note: If the switcher is operating in 1080p 59.94, you can only use a maximum of 7 frame synchronizers to sync 1080p 59.94 video inputs. This can be up to 3 FSFCs and 4 MSFSs or 6 FSFCs and 1 MSFS. Format conversion is not restricted.

General Purpose Interface (GPI)

The switcher is equipped with 24 GPI I/Os that can be assigned as either an input or output independently.

The GPI inputs allow the switcher to interface with peripheral equipment such as editors. Each GPI input can be used to perform simple editing and switcher functions such as fade to black or an auto transition.

LiveEDL

Edit Decision Lists (EDL) are files used by non-linear editing (NLE) suites to aid in post-production. Your switcher can capture EDL data in a file that you load into your NLE suite.

A Ross® GearLite TSC-9902 must be connected to the serial port of the switcher to provide timecode for the EDL.

For information on using the LiveEDL feature, visit the Ross Video Website (rossvideo.com).

Matte/Wash Generator

A matte generator and complex wash generator per ME, capable of multi-color washes comes standard. Any one of the color generators can be assigned to MATTE, or wipe pattern edges. An additional simple color generator is available for an Aux Bus.

ME Effect System

The ME (Multi-level Effect) systems are standard. The number of MEs depends on the chosen switcher model.

Each ME provides 4 keyers supporting pattern mask, box mask, self-key, linear key, and an UltraChrome advanced chroma key for each ME and is available to each keyer.

Media-Store

Up to 4 independent channels of still/animations are available switcher-wide, allowing for thousands of full screen stills and logos that can be cached and used on the switcher.

Media-Store provides 8 GB of cache. The number of images cached increases considerably when smaller, non-full screen images like logos are loaded from USB.

MediaManager

The MediaManager allows you to easily manage stills and animations on the switcher in a graphics interface.

MediaWipe

A MediaWipe allows you to use an animation from the Media-Store to play over a background or key transition. When the transition starts, the switcher plays the selected animation over top of the background and keys that are being transitioned. A cut, dissolve, wipe, or DVE wipe is then performed layered under the animation to bring up the next shot when the animation ends.

Clip Player

The clip player offers a single playout channel for compressed MPEG-4 AVC (ITU-T H.264) that can be assigned as a source on any bus in the switcher. Basic transport controls can be performed manually from the **Clip Player** page, using custom controls, or through AMP commands.

MemoryAI Recall Mode

We take the guessing out of memory recalls by ensuring that a memory recall will not affect what is currently on-air. MemoryAI uses the content of the memory to configure the Next Transition area and Preview bus for the background and keyers so that the next transition takes the same sources on-air that were on-air in the memory.

For example, store a memory that has a key on-air with CAM1 and CAM2 selected on the background. When this memory is recalled normally, it pops the same key on-air with CAM1 and CAM2 on the background. When the memory is recalled with MemoryAI turned on, CAM1 is selected on the preset bus, and CAM2 is selected on a key that is not on-air. The transition area is then set up for a background transition to bring CAM2 onto the background, take any on-air keys off, and take a key on-air with CAM1.

Memory System

Storage for 100 complete switcher snapshots per ME, MiniME™, and MultiScreen comes standard with all switchers. All of these

memories can be stored to a USB media drive, providing custom tailored memories for every operator and every show.

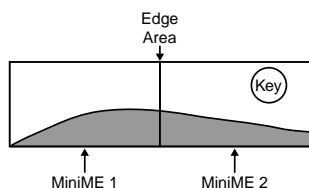
MiniME™

The MiniME™ is an additional ME that is provided with the switcher to perform basic dissolves and cuts. Each MiniME™ has 2 keyers, background, and preset buses. Unlike a full ME, the MiniME™ only supports dissolves and cuts, restricts key 1 to DVE keys only, and has no preview output. Key 2 on a MiniME™ is the same as an ME keyer. The MiniME™ shares all the same sources as the ME.

MultiScreen

The switcher comes standard with 1 integrated MultiScreen generator. The MultiScreen can break a scene into up to 2 outputs that can be sent to independent projectors or displays to make a unified picture.

Each screen in the MultiScreen output uses a MiniME™ to create the background and key of the output.



Note: No edge blending is available.

MultiViewer

The MultiViewer allows you to view up to 10 video sources, in 23 layouts, from a single output BNC. Any video source on the switcher, including ME Program, Preview, and Media-Store channels, can be routed to any box on the MultiViewer. All boxes on the MultiViewer output include mnemonic source names and red and green tallies.

The Carbonite Black Solo comes standard with 1 broadcast-quality integrated MultiViewer generator. Only one MultiViewer output is supported at a time from the switcher on output BNC 5, or HDMI OUT1.

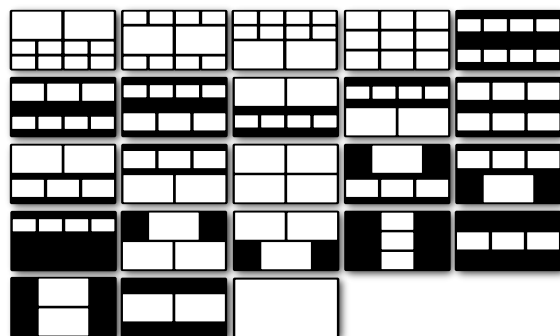


Figure 1: HD Layouts

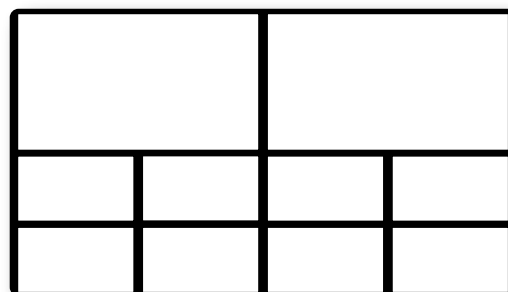


Figure 2: MultiViewer Grid

Pattern and Matte/Wash Generators

A single pattern generator dedicated to wipes comes standard, and is equipped with 10 classic wipes. Most wipes can be rotated, bordered, multiplied, aspectized, and repositioned.

Tally Outputs

The switcher has 16 assignable tally relays. Each tally can be assigned to any number of combinations of input and output or bus.

UltraChrome

The UltraChrome chroma keyers uses advanced video processing technology to provide exceptional blue spill reduction and clean edges, even with difficult source material. Glass, smoke, translucent materials, and natural shadows are handled superbly.

There is 1 floating Chroma Key.

XPression Live CG

Seamlessly combine the creative power of the Ross® XPression Designer software with the ease of use of your Ross® switcher. Create stunning still graphics using XPression Designer, and

transfer them directly to an media-store channel on the switcher using the RossLinq interface. Up to two (2) channels with dedicated alpha can be controlled from the XPression Software Client. This feature supports still images only. Each switcher comes with a single license of XPression Live CG. Additional licenses can be ordered.

Product Comparison

Use the following table to compare the different switchers in the product line.

Carbonite Black Solo Frame

	Carbonite Black Solo	Carbonite Black 109	Carbonite Black Solo 13	Carbonite Black 113
Frame				
Separate Rack Frame	No	Yes	No	Yes
Rack Frame Height	n/a	2 RU	n/a	2 RU
Redundant Power	Yes (optional)			
Video Input/Output				
Multi-Definition HD/SD	1080i 50/59.94, 720p 50/59.94, 1080pSF 23.98/25/29.97, 1080p 25/29.97			
Standard Definition Processing	525, 625			
SDI Inputs (Max)	6	6	12	12
HDMI Inputs (Max)	3	3	1	1
SDI Outputs (Max)	5	5	5	5
HDMI Outputs (Max)	1	1	1	1
Clean Feed System	Yes			
FSFCs (Max/Min)	6	6	6	6
Input Reference Format	Internal / Black Burst / Tri-Level			
Independent Reference Inputs	1			
Independent Reference Outputs	2			
MultiViewer Generators	1			
Effects Capabilities				
Keys per ME	4			
2D DVE Channels per ME	2			

	Carbonite Black Solo	Carbonite Black 109	Carbonite Black Solo 13	Carbonite Black 113
Proc Amps and Color Correctors	No			
Memory AI	Yes			
UltraChrome Chroma Keys per ME	2			
UltraChromeHR Ready	No			
Storage and Networking				
USB Media Drive	Yes (user supplied USB 2.0)			
Media-Store Channels	4			
Media-Store CACHE	8 GB			
Audio Only Payout for Media-Store	Yes			
Ethernet Connectivity	2 GigE			
Linux OS	Yes			
Animated Logo Players with Audio (requires video and alpha payout)	Yes			
Peripheral Interfacing				
Device Control	Yes			
OverDrive® Caprica Compatible	Yes			
Roll Clip Control	AMP/RossTalk/GPI Output			
External Link Ports	1			
Serial Ports	1 (RJ45)			
Ethernet Serial Port Expanders	Comtrol® DeviceMaster® RTS Series, Moxa Nport® 5150A			
Automation and Editor Protocols	RossTalk/GVG100			
GPII/Os	24			
Tallies	16613-266-0183			
USB Ports	1 (Frame)			

Standard System

The Carbonite Black Solo comes either as an all-in-one panel and frame, or as a standalone frame. The standalone frame requires DashBoard to operate the switcher.

Option	Description
CB-SOLO	An integrated panel and frame with a single panel row with 9 source and custom control buttons, 4 key transition buttons, 4 key type buttons, and 4 aux bank buttons. Has the same connections as the CBF-109 frame.
CB-SOLO-13	An integrated panel and frame with a single panel row with 9 source and custom control buttons, 4 key transition buttons, 4 key type buttons, and 4 aux bank buttons. Has the same connections as the CBF-113 frame.
CB9-PANEL	A single panel row with 9 source and custom control buttons, 4 key transition buttons, 4 key type buttons, and 4 aux bank buttons.
CBF-109	A 1 ME frame with 6 SDI input BNCs, 3 HDMI™ inputs, 5 SDI output BNCs, 1 HDMI™ output, 24 GPIs, 16 tallies, and 1 AES output.
CBF-113	A 1 ME frame with 12 SDI input BNCs, 1 HDMI™ input, 5 SDI output BNCs, 1 HDMI™ output, 24 GPIs, 16 tallies, and 1 AES output.

System Options

Options are typically ordered when the switcher is purchased. However, you can order options if your needs change in the future. Most of our options can be easily installed in the field. You can take comfort in knowing that you can purchase options in the future and that installation at your site will be a smooth process.

XPression Live CG (XDS0-0001-CPS)

Each switcher comes standard with a single license of XPression Live CG that provides up to two (2) channels with dedicated alpha that can be controlled from the XPression Software Client. This feature supports still images only.

The XPression Designer requires a computer with a Windows® 7 and 10 (32/64 bit OS) operating system and an NVIDIA® graphics card.

Redundant Power

The redundant power supply options provides protection against AC power failure. It allows two external power supplies to receive power from independent power sources. Complete failure of one source, or power supply, will not affect the operation of the switcher in the slightest. If the main AC power fails, the switcher instantly draws power from the remaining source. The transition from one power source to the other is totally transparent and has no effect on the output of the switcher; a critical feature should one power source fail during an on-air broadcast.

Option	Description
PSU-12V9A-6PIN	Adds a redundant power supply for the CB-SOLO, CB-SOLO-13 all-in-one systems, and the CBF-109 and CBF-113 frames.
PSU-12V4A-2PIN	Adds a redundant power supply for the CB9 control panel.

Remote Panels

This option provides external control for selecting sources on an Aux bus from a remote panel. There are a number of options for the remote control panels, depending on your requirements.

Option	Description
RCP-ME	Adds the 40 source button ethernet enabled RCP-ME remote control panel with integrated backlit display.
RCP-QE18	Adds the 18 mnemonic source button ethernet enabled RCP-QE18 remote control panel.
RCP-QE36	Adds the 36 mnemonic source button ethernet enabled RCP-QE36 remote control panel.

DashBoard Display (CBPS-DashMenu)

The DashBoard Display combines a DashBoard computer with a touchscreen into a single unit that can be installed onto a standard VESA-100 mount. The DashBoard Display connects to the switcher over ethernet to provide the advanced menu system interface to the setup and operation of your Carbonite or Carbonite Black switcher.

The DashBoard Display eliminates the need to connect another computer to your switcher network just to run DashBoard.

Panel Mounting Options

The Carbonite Black Solo all-in-one and CB9 can be mounted into a desk or equipment rack.

Option	Description
CBF-SOLO-DESKMOUNTKIT	The Desk Mount Kit provides the hardware for mounting your Carbonite Black Solo into a desk or rack shelf.
CBF-SOLO-RACKMOUNTKIT	The Rack Mount Kit provides the hardware for mounting your Carbonite Black Solo into an equipment rack.

SMC-9901 Serial to MIDI Converter (SMC-9901)

The SMC-9901 Serial to MIDI Converter is used to allow control of an Audio Mixer from a Ross Video switcher.

The SMC-9901 provides a single DB-9 connector for 38,400 baud serial RS-422 communication, one 5-pin DIN connector for MIDI in, and two 5-pin DIN connectors for MIDI out. Power, Serial

Tx and Rx, MIDI In and MIDI Out Status LEDs next to the ports show activity status.

The SMC-9901 connect to the switcher via the serial port on the frame, or an external port expander such as the Comtrol® DeviceMaster®.

TSC-9902 Linear Timecode to Serial Converter (TSC-9902)

The TSC-9902 Linear Timecode to Serial Converter is a high-quality signal conversion solution within the family of GearLite compact, self-contained modular products. Supporting Linear Timecode Signal (LTC) to Serial conversion, the TSC-9902 is the ideal converter for interpreting linear timecode and sending the timecode over a serial port to Carbonite Solo.

The TSC-9902 provides a single DB-9 connector for 38,400 baud serial RS-422 communication, and one BNC connector for LTC input. Note that the shell of the BNC connector is isolated from ground. Power, LTC Status, and Serial Tx LEDs show activity status.

A universal power adapter and line cord, suitable for the country of use, is supplied with each module. Various mounting options are included that enable a wide range of installation choices.

The TSC-9902 connect to the switcher via the serial port on the frame, or an external port expander such as the Comtrol® DeviceMaster®.

SHC-9642 SDI to HDMI Converter (SHC-9642)

The SHC-9642 SDI to HDMI Converter is a high-quality signal conversion solution within the family of GearLite compact, self-contained modular products. The SHC-9642 is the ideal solution for converting any SDI input signal (up to 3Gb/s) into an HDMI Type-A output format. User-selectable audio decoding is available with unbalanced, stereo analog audio outputs. Up to 16 channels of embedded audio are selectable, in stereo pairs, for de-embedding and decoding.

Onsite Operational Training (CARBONITE-OTR-1DAY)

Although Ross Video switchers are designed to be as easy as possible to install and operate, training is highly recommended to ensure that

the process of taking your Ross Video switcher to air is a smooth one.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple MLE systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added with the **CARBONITE-OTR-1DAY** option. Please quote one additional option for each additional day of training required.

Customers cancellation or rescheduling of on-site services without seven (7) calendar days advanced notice will incur full invoice.

Online Operational Training (CARBONITE-ONL-1DAY)

Sometimes you don't need the hands-on attention that having a trainer come to your facility provides. In these situations Ross Video provides comprehensive, web-based, online training.

Two (2) days, or more, of training is recommended for multiple ME systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added with the **CARBONITE-ONL-1DAY** option. Please quote one additional option for each additional day of training required.

Customers cancellation or rescheduling of on-site services without seven (7) calendar days advanced notice will incur full invoice.

Onsite Technical Training (CARBONITE-OTT-1DAY)

On-site technical training introduces the user to some of the technical aspects of switcher operation and maintenance. This includes, but is not limited to; Basic operation, Switcher installation and configurations, Peripheral interfaces, Video signal flow, System timing requirements, Circuit block diagrams, Circuit board overviews, Jumpers and indicators, Troubleshooting tips, Software upgrading, and Routine maintenance.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video

cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple ME systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added with the **CARBONITE-OTT-1DAY** option. Please quote one additional option for each additional day of training required.

Onsite Commissioning (CARBONITE-COM-1DAY)

On-site Commissioning is a great way to ensure that your switcher is properly installed into your facility and tuned to maximum performance.

Once the customer has installed and cabled the equipment, a Ross Commissioning expert will come on site to get the switcher configured, verify that all peripheral interfaces are operating properly, provide a basic technical orientation, and help you get on the air.

Training is provided on the customer's equipment at their site. Expenses are extra, and billed at the completion of the visit. Ross Video cannot guarantee the availability of a local Trainer, as such, travel costs to all locations will be invoiced at cost. Two (2) days, or more, of training is recommended for multiple MLE systems. Four (4) weeks advanced scheduling notice is required. Additional days of training can be added with the **CARBONITE-COM-1DAY** option. Please quote one additional option for each additional day of training required.

Customers cancellation or rescheduling of on-site services without seven (7) calendar days advanced notice will incur full invoice.

Please note that commissioning does not replace operator or technical training. Contact your Ross representative to discuss which types of assistance are best suited to your needs.

Extended Warranty

This extends the standard one-year warranty on your control panel or frame by one year. Additional years can be purchased if required.

Option	Description
CB-SOLO-13-ROSSCARE	Adds an additional year of warranty to the CB-SOLO-13 switcher.
CBF-109-ROSSCARE	Adds an additional year of warranty to the CBF-109 frame.
CBF-113-ROSSCARE	Adds an additional year of warranty to the CBF-113 frame.
CB9-PANEL-ROSSCARE	Adds an additional year of warranty to the CB9 control panel.

Option	Description
CB-SOLO-ROSSCARE	Adds an additional year of warranty to the CB-SOLO switcher.

Specifications

The information in this section is subject to change without notice.

Switcher Resources

The number of resources specific to your switcher depends on the options installed.

Resource	Carbonite Black Solo / Carbonite Black 109	Carbonite Black Solo 13 / Carbonite Black 113
2D DVE Channels per ME	2	2
Aux Buses	16	16
Chroma Keys per ME	1	1
Custom Controls	256	256
FSFCs	6	6
GPI I/Os	24	24
Keyers per ME	4	4
Keyers per MiniME™	2	2
Matte Generators per ME	2	2
Media-Store Channels	4	4
Media-Store CACHE	8 GB	8 GB
Memories per ME	100	100
MEs (max)	1	1
MiniME™ Engines	2	2
MultiScreen Generators	1	1
MultiViewer Boxes	10	10
MultiViewer Layouts	23	23
MultiViewer Heads	1	1
Pattern Generators per ME	2	2
Tallies	16	16
SDI Video Inputs	6	12
HDMI Video Inputs	3	1
SDI Video Outputs	5	5
HDMI Video Outputs	1	1
Carbonite Black Solo/Carbonite Black 109 IP Address	192.168.0.123	
CB9 Control Panel IP Address	192.168.0.129	

Hardware Weights

Weights are for units alone. Power supply weights do not include cables or connectors.

Hardware	Weight
CB9 Panel	9 lbs (4.08kg)
CB-SOLO	10 lbs (4.54kg)
CB-SOLO-13	11 lbs (4.99kg)
CBF-109	8 lbs (3.63kg)
CBF-113	9 lbs (4.08kg)
CB9 Power Supply	0.67 lbs (0.305kg)
CBF-109, CBF-113, CB-SOLO, CB-SOLO-13 Power Supply	1.37 lbs (0.620kg)

Environmental Characteristics

All Switchers	
Ambient Temperature Range	0 - 40°C (32 - 104°F)
Frame Cooling	Active, Front-to-Back airflow
Control Panel Cooling	Passive

Video Input Specifications

Input Specification	Value
Equalization (using Belden 1694 cable)	>50m @ 3Gb/s
	>100m @ 1.5 Gb/s
	>300m @ 270 Mb/s (5°-40°C)
Impedance	75 ohms, terminating
Video Inputs, SDI	SMPTE 259M/292M/424M serial digital (non-looping)
Video Inputs, HDMI	HDMI 1.4
	High Speed HDMI Cable (Max 10m)
Reference Inputs (non-terminating, looping)	Standard Definition — analog black
	High Definition — tri-level sync

Video Output Specifications

Output Specification	Value
Return Loss	<-23dB @ 1.5GHz
	<-18dB @ 3GHz

Output Specification	Value
Rise and Fall Time	800ps ±10% (SD)
	240ps ±10% (HD)
Signal Level	800mV ±10%
DC Offset	0 Volts
Overshoot	<10%
Video Outputs, SDI HD Mode	10-bit SMPTE-292M/424M serial digital
Video Outputs, HDMI	HDMI 1.4
	High Speed HDMI Cable (Max 10m)

System Timing

- All video inputs zero time relative to reference input, auto timing will correct for inputs out of time by up to +/- 0.25 line.
- System delay is less than 1 line.

Power Consumption

	CB-SOLO	CB-SOLO-B	CBF-109	CBF-113	CB9 Panel
Power	57W 4.75A 12V	66W 5.5A 12V	45W 3.75A 12V	48W 4.00A 12V	24W 2A 12V
Input Voltage	100 - 120V~, 220 - 240V~, 47-63Hz, 1.6A				

Audio Specifications

Specification	Carbonite Black Solo
Audio Depth	24-bit AES3 in HD (20-bit in SD)
Channels	1 Stereo Pair (2 channels)
Output	AES
File Format	Multi-channel Waveform Audio File (.wav)
Impedance	110 Ohms, differential
Minimum/Maximum output voltage swing	1.5/6V peak-to-peak
Rise and Fall Times	20ns, typical
Sample Rate	48kHz
Synchronization	Locked to Video

Jitter

Specification	Value
HD - Tri-Level Sync	Alignment (> 100kHz) < 0.2UI
	Timing (<10Hz) < 1.0UI
HD - Composite Reference	Performance not guaranteed with composite reference
SD - Tri-Level Sync	Alignment (> 1kHz) < 0.2UI
	Timing (<10Hz) < 0.2UI
SD - Composite Reference	Alignment (> 1kHz) < 0.2UI
	Timing (<10Hz) < 0.5UI

Option Summary

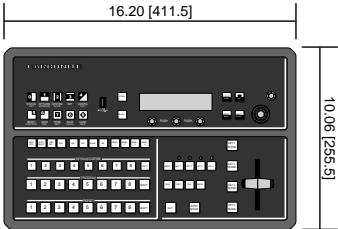
Use the available options listed in the following tables for each control panel or frame.

	Carbonite Black Solo	Carbonite Black 109 (fame only)	Carbonite Black Solo 13	Carbonite Black 113 (fame only)	CB9 (panel only)
Carbonite Black Solo	CB-SOLO	CBF-109	CB-SOLO-13	CBF-113	CB9-PANEL
Redundant Power	PSU-12V9A-6PIN				PSU-12V4A-2PIN
Extended Warranty, Carbonite Black Solo	CB-SOLO-ROSSCARE	CBF-109-ROSSCARE	CB-SOLO-13-ROSSCARE	CBF-113-ROSSCARE	CB9-PANEL-ROSSCARE
Switcher Options					
Desk Mount Kit	CBF-SOLO-DESKMOUNTKIT		CBF-SOLO-DESKMOUNTKIT		CBF-SOLO-DESKMOUNTKIT
Rack Mount Kit	CBF-SOLO-RACKMOUNTKIT		CBF-SOLO-RACKMOUNTKIT		CBF-SOLO-RACKMOUNTKIT
DashBoard Display	CBPS-DashMenu				
SHC-9642 SDI to HDMI Converter	SHC-9642				
SMC-9901 Serial to MIDI Converter	SMC-9901				
TSC-9902 Linear Timecode to Serial Converter	TSC-9902				
XPression Live CG	XDS0-0001-CPS				
Training Options					
Online Operational Training	CARBONITE-ONL-1DAY				
Onsite Commissioning	CARBONITE-COM-1DAY				
Onsite Operational Training	CARBONITE-OTR-1DAY				
Onsite Technical Training	CARBONITE-OTT-1DAY				

Dimensions

Dimensions are in inches with metric dimensions shown in brackets [mm].

Carbonite Black Solo (CB-SOLO/CB-SOLO-13/CB9)



Carbonite Black Solo Frame (CBF-109/CBF-113)

