

Canon

4K

# CINE-SERVO CN20×50 IAS H



 CINEMA EOS SYSTEM

# CINE-SERVO CN20×50 IAS H

## Super35 Meets Super Telephoto

With the advance of digital cinematography, most new digital cine cameras have made use of the entrenched large global inventory of 35mm motion picture film lenses. Digital cinematography has squarely encompassed the emerging 4K movement – in both the television-centric UHD and the cinema-centric 4K digital motion imaging production formats.

In the broadcast industry, large-format cameras and lenses for digital cinema are now being adopted for applications such as dramas, documentary programs, and promotional videos because of their superb imaging characteristics.

Documentary, sports coverage and natural history programs seek extended focal ranges. Such focal ranges in the Super 35mm image format size with full 4K optical performance, pose significant challenges to size and weight of the lens.

In recognition of this pressing production need, the CN20×50 IAS H ultra-telephoto zoom lens in Super 35mm format has been developed, significantly extending the imaging capabilities of 4K large-format cameras.

## Powerful 4K images created by unprecedented 1500mm focal length

The CN20x50 IAS H is a zoom lens for the Super 35mm format, having the superiority of the longest focal length(\*) of 1500mm (with a 1.5× extender) and the highest zoom ratio(\*) of 20× in the world of the Super 35mm format that offer a whole new image expression.

Built-in 1.5× "4K" extender is another first in the large format optical arena, which maintains excellent 4K image quality. The lens weighs only 6.6 kg and has an overall length of only 405.2mm (\*\*), a combination that will readily support carryable documentary, natural history and sports shooting.

(\*) As of September 2014

(\*\*) (PL Mount) CN20x50 IAS H/P1 : 405.2mm

(EF Mount) CN20x50 IAS H/E1 : 413.2mm



f = 50mm



f = 1000mm

### Conversion Table

	Focal Length(mm)	with 1.5× Ext(mm)
Super 35mm	50 – 1,000	75 – 1,500
2/3"	App. 20 – 370	App. 30 – 560
35mm	App. 75 – 1,460	App. 110 – 2,190

## 4K Optical Performance

The 4K optical performance is carefully managed across the entire image plane to ensure superb subjective sharpness especially on the wider angle settings. Sophisticated computer simulation in the design phase produced an excellent final optimization that maintains the 4K optical performance over the entire focal range even when the built-in extender is in use and over an object distance ranging from the minimum object distance to infinity.

New glass materials assisted in the goal of achieving the necessary tight control of optical aberrations.

The most contemporary multilayer optical coatings ensure very high contrast by their superb control of black reproduction augmented by optical and mechanical design innovations that substantially reduced flare and any internal reflections.

Similar attention to minimization of ghost images and other highlight-related color bleeding extend the operational contrast range of the lens.



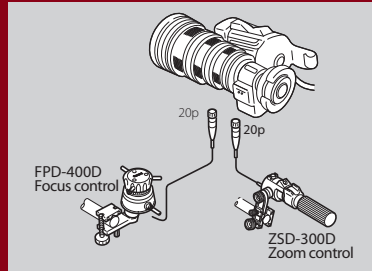
# Imaging Excellence with Optimized Operational Performance

## ■ Lens with ultra-long focal length, 4K optical performance, and high carryability

The lens has a 1,500mm focal length at the telephoto end (with a 1.5x extender), a total length of 405.2 mm (PL mount), and a weight of 6.6 kg. Even when shooting documentaries in a harsh natural environment, this lens enables unprecedentedly expressive and dynamic 4K images at a distance from the subject.

## ■ Studio Broadcast Lens Controllers

When used in a studio lens-camera configuration the CN20x50 IAS H drive unit has three 20-pin connectors that facilitate the use of Canon standard broadcast zoom and focus controllers (such as the ZSD-300D and FPD-400D).

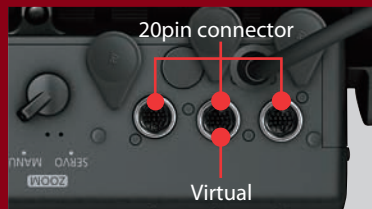


## ■ Immediate system start-up

The drive unit has a high-performance encoder so that the lens requires no initialization. Since the encoder does not require the initialization operation when the lens is powered on, the system can be started immediately.

## ■ Support for Virtual Image Data Output

The drive unit has a 20-pin connector which outputs 16-bit precision data for zoom, iris, and focus to support precision virtual imaging systems.



## ■ Standard Broadcast Camera Interface

A 12-pin connection cable from the drive unit carries the standard serial communication for broadcast lenses – ensuring that the CN20x50 IAS can be used with all professional Super35mm digital cine cameras. The camera supplies power to the drive unit via this connection and remote iris operation is supported.

## ■ Iris close function

The lens can close the iris completely, which is necessary to calibrate black balance.

## ■ Flange-back adjustment mechanism

The lens enables flange-back adjustment with an operation as easy as that of broadcast ENG lenses.

## ■ Operability and functions ideal for broadcast lens users

The lens offers the equivalent servo operation feel as broadcast portable lenses for all focus, zoom, and iris controls. The focus ring is provided with a knurled rubber for superior operability, which allows the equivalent manual operation feel as broadcast portable lenses.



## ■ Servo Cine Lens

The CN20x50 IAS H has a newly designed digital servo system that employs the miniature 16-bit optical encoders that endow the control of zoom, iris, and focus with the same legendary precision for which Canon is world-famous in the 2/3" ENG/EFP domain. This new digital drive system is compact and lightweight while providing impressive power to actuate the full 20:1 zoom range in 1.5 seconds – ensuring image capture in critical moments. Wide-ranging zoom speeds up to a maximum of 180 seconds support special creative shooting. The encoders do not require any initialization operation and accordingly the system starts immediately upon switch-on.



## ■ World's first built-in 1.5x "4K" extender

The lens has a built-in 1.5x extender, which makes it the first zoom lens with a servo unit for Super 35mm sensor cameras. The lens is capable of 4K resolution performance even when a 1.5x extender is inserted.

## ■ Display for easy user settings

The display of the lens drive unit enables easy operation of digital functions such as speed and frame presets and shuttle shot in the same way as Canon's high-end broadcast portable television lenses.

Speed Preset : A specific zoom speed can be preset in memory

Frame Preset : An angle of view can be preset in either of two memories

Shuttle Shot : Automatically shuttle between two focal length.

## ■ Macro function

The lens enables macro shooting with an operation as easy as that of broadcast ENG lenses.

## ■ Robustness and durability

The lens features an optimal housing structure made by combining the know-how acquired through the development of Canon broadcast lenses with the latest simulation technologies. The lens provides a robustness and durability that can endure in severe operating environments for broadcast applications.

## ■ Handheld Cinematography Shooting

Not all productions will require the digital servo drive, with many preferring traditional manual cinematography style shooting – Canon has designed the system so that the servo unit can be removed. In this mode the manual focus control has a total rotation angle of 180 degrees. If the drive unit is removed for a specific production and then re-mounted – this can be done in any rotation position and there is no need to adjust gear positions (zoom, iris, and focus).



## ■ Compatible with cinema industry standard Super 35mm image sensor



## ■ 19mm-diameter rod system

The lens is equipped with a support holder for cinema lens support rods that can be used with 19mm-diameter rod systems. An extension shaft (included in the product) is required to use the 19mm-diameter rod system.

## ■ Compliant with wide-ranging communication standards and with a lens-to-camera communication function for added convenience

EOS Lens Data Communication

• For the CN20x50 IAS H/E1 using the EF mount, data management functions and image compensation are enabled by Canon's direct electrical communication between Cinema EOS cameras and this lens.

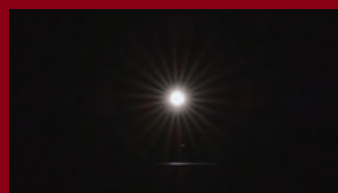
Cooke /i Lens Camera Data

• The lens supports the widely accepted Cooke /i Technology for direct transmission of lens data to the camera.

• Furthermore, the lens is provided with the standard 12-pin interface connector that is used in the broadcast industry. Therefore, the lens can perform the same type of communications as conventional broadcast portable lenses, such as transmission of focus, zoom, and iris position data as well as remote-controlled operation of the iris.

## ■ 11-blade aperture diaphragm

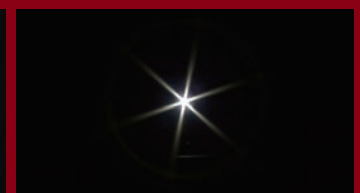
The lens is equipped with multiple blades that make the aperture diaphragm rounder and achieves a soft and natural blur effect. It has also adopted an odd number of blades so that the beams of received light spreads without affecting facing diffraction light each other and creates a soft and elegant beam of light when optimal focus is achieved.



EF Cinema Lens 11 blades



9 blades



6 blades

## ■ Easier-to-read ring markings

- The lens provides focus ring markings on angled surfaces on the lens barrel, which makes it easy to read the focus settings from behind the camera.
- Each ring marking is indicated on both sides of the lens to facilitate operation when the cinema camera users use the lens at a movie shooting location. The ring markings indicated on one side of the barrel are coated with luminous paint so that they can be easily read even in the dark.
- The focus ring markings are indicated both in feet and metric units (ft/m), making it unnecessary to replace the focus ring in order to switch from feet to metric and vice versa.



Focus indicators are marked on the inclined surface. The focus ring markings are indicated both in feet and metric units(ft/m).

## ■ Easy-to-understand focal length indications

The focal length is indicated on the side of the lens front barrel. The lens adopts customary "focal length indications" normally used by cinema camera users.



## ■ Support for cinema industry standard accessories

The lens can be used with standard accessories in the cinema industry, such as a matte box, follow focus gear systems, and electronically operated controllers. The focus ring is equipped with 0.8mm and 0.5mm gear modules and the zoom ring is equipped with a 0.5mm gear module, and these make it possible to use the lens with standard accessories in the cinema industry. (The iris ring is equipped with a 0.5mm gear module.)



# Canon's proprietary optical technology that realizes high image quality EF Cinema lenses\*

## Lens with ultra-long focal length, 4K optical performance, and high carryability

Theoretically, in order to shoot an object dimension in Super 35mm equivalent to that of a 2/3" format camera lens, it is necessary to have a focal length that is about 2.7 times longer, which significantly affects the size of the lens. To obtain the brightness of a long focal length lens, a large diameter lens is required, thus making the size of the lens front huge. Because there is a close relationship among focal length, optical performance, and size of the lens, highly advanced technology is required to achieve the proper optical balance among them.

Canon has put together industry cutting-edge technologies such as advanced optical simulation technology, as well as the optimal layout of the glass and mechanical components, wide-diameter aspherical lens technology, and the most suitable optical glass materials to develop a lens that achieves a high level of total balance.

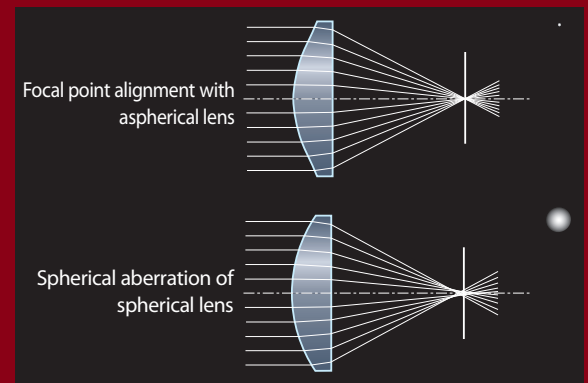
## Multilayer coating technology that reduces lens flare and ghosting

The newly developed EF Cinema lenses and EF lenses have a coating that is optimized for digital camera photography. For example, these lenses are provided with the optimal multilayer coating to prevent the reflection of incident lights on a lens and to reduce flare and ghosting. The EF Cinema lenses use an anti-reflection lens coating that further reduces the occurrence of flare and ghosting.



## Aspherical lens technology

A spherical lens refracts more in the peripheral parts than in the center. For that reason, these lenses are subject to spherical aberration. On the other hand, an aspherical lens can gather all light that passes through the center and peripheral parts of the lens at one point. This technology makes it possible to use an aspherical lens to provide the same correction effect that would normally need several spherical lenses, thus reducing the overall number of lenses required. This technology therefore helps produce sharp images through high optical performance, as well as being compact and lightweight.



## Canon's superb optical material technology

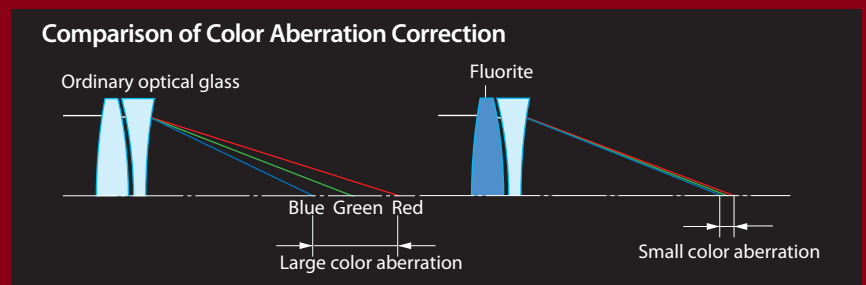
### [Fluorite]

Theoretically, a slight chromatic aberration always occurs in standard optical glass. The use of fluorite resolves this issue by making the ideal chromatic aberration correction. Many of Canon's zoom lenses demonstrate a correction effect particularly at the telephoto side that has a large aberration.



### [UD and Hi-UD glasses]

An Ultra-low Dispersion (UD) glass has characteristics similar to fluorite. Since a UD glass has low dispersion as well as abnormal dispersibility, it can produce an effect similar to fluorite with an optimal layout of the glasses. A Hi-UD glass has a high refractive index and provides chromatic and spherical aberration correction effects while also providing the low dispersion and abnormal dispersibility of a UD glass. A Hi-UD glass is used in such products as zoom lenses and works effectively to reduce the aberration fluctuations caused by focusing and zooming, in addition to reducing the chromatic aberration that occurs at the telephoto side.



\*: Technology applied to the lenses would differ depending on the model.

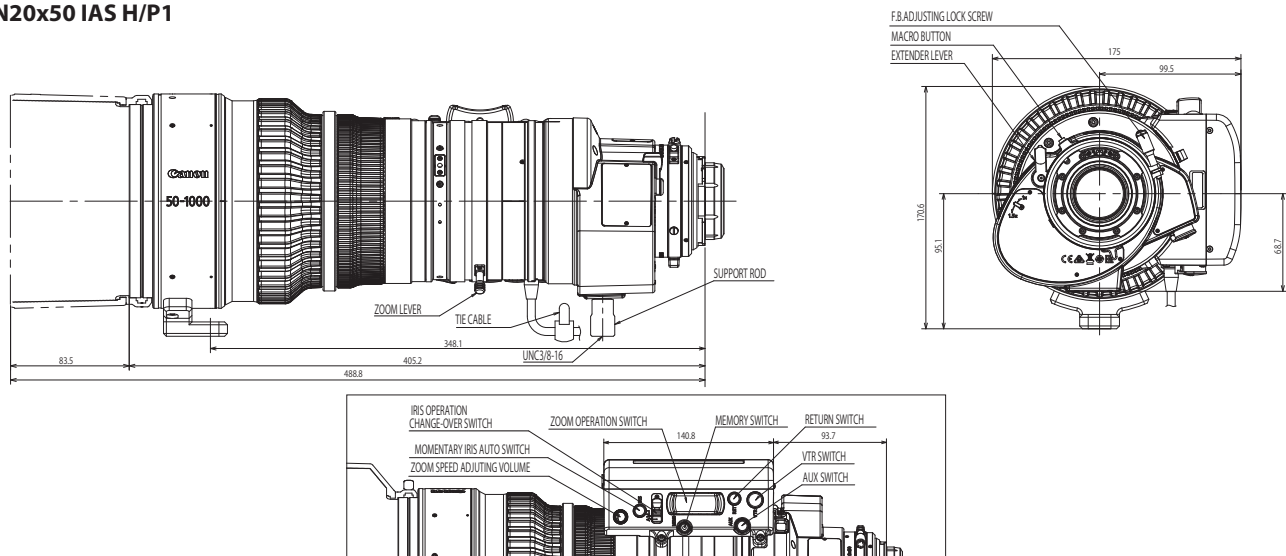
## SPECIFICATIONS

	CN20x50 IAS H/E1 or CN20x50 IAS H/P1	
Built-in extender	1.0x	1.5x
Mount	EF or PL	
Image format	Super35mm	
Focal Length	50 – 1,000mm	75 – 1,500mm
Zoom Ratio	20x	
Max. Relative Aperture (T-number)	1:5.0 at 50 – 560mm 1:8.9 at 1,000mm	1:7.5 at 75 – 840mm 1:13.35 at 1,500mm
Iris Blades	11	
Angle of view [1.9:1 26.2 × 13.8]	29.4° × 15.7° at 50mm 1.5° × 0.8° at 1,000mm	19.8° × 10.5° at 75mm 1.0° × 0.5° at 1,500mm
M.O.D.*	3.5m / 11.5' (From image sensor) 1.54m / 5.1' (From lens front with macro)	
Object dimension at M.O.D [1.9:1 26.2 × 13.8]	148.3 × 78.1cm at 50mm 7.8 × 4.1cm at 1,000mm	98.9 × 52.1cm at 75mm 5.2 × 2.7cm at 1,500mm
Front Diameter	φ 136mm	
Approx. Size(W × H × L)	[EF Mount] 175 × 170.6 × 413.2mm [PL Mount] 175 × 170.6 × 405.2mm	
Approx. Mass	6.6kg/14.55lbs	
Pitch of gear	Focus : 0.5mm or 0.8mm Zoom : 0.5mm Iris : 0.5mm	

\* M.O.D. = Minimum Object Distance

## DIMENSIONS

### CN20x50 IAS H/P1



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