

# Lens mount

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A **lens mount** is an interface — mechanical and often also electrical — between a photographic camera body and a lens. It is confined to cameras where the body allows interchangeable lenses, most usually the rangefinder camera, single lens reflex type or any movie camera of 16 mm or higher gauge. Lens mounts are also used to connect optical components in instrumentation that may not involve a camera, such as the modular components used in optical laboratory prototyping which join via C-mount or T-mount elements.

A lens mount may be a screw-threaded type, a bayonet-type, or a breech-lock (friction lock) type. Modern still camera lens mounts are of the bayonet type, because the bayonet mechanism precisely aligns mechanical and electrical features between lens and body. Screw-threaded mounts are fragile and do not align the lens in a reliable rotational position, yet types such as the C-mount interface are still widely in use for other applications like video cameras and optical instrumentation.

Bayonet mounts generally have a number of tabs (often three) around the base of the lens, which fit into appropriately sized recesses in the lens mounting plate on the front of the camera. The tabs are often "keyed" in some way to ensure that the lens is only inserted in one orientation, often by making one tab a different size. Once inserted the lens is fastened by turning it a small amount. It is then locked in place by a spring-loaded pin, which can be operated to remove the lens.

Lens mounts of competing manufacturers (Nikon, Canon, Contax/Yashica, Pentax, etc.) are almost always incompatible. In addition to the mechanical and electrical interface variations, the flange focal distance from the lens mount to the film or sensor can also be different. Many allege that these incompatibilities are due to the desire of manufacturers to "lock in" consumers to their brand.

In movie cameras, the two most popular mounts in current usage on professional digital cinematography cameras are Arri's PL-mount and Panavision's PV-mount. The PL-Mount is used both on Arri and R.E.D. digital cinematography cameras, which are in 2012 the most used cameras for films shot in digital. The Panavision mounts are exclusively used with Panavision lenses, and thus are only available on Panaflex cameras or third-party cameras "Panavised" by a Panavision rental house, whereas the PL-mount style is favored with most other cameras and cine lens manufacturers. Both of these mounts are held in place with locating pins and friction locking rings. Other mounts which are now largely historical or a minority in relation to current practices are listed below.



female lens mount of an Minolta XD-7  
with male mount of Minolta  
MC-Rokkor 58mm 1:1.4 lens



Pentax K-7 with visible lens mount

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## List of lens mount types

These types are organized by category; find details in the section that follows.

### Stills

- Canon EF
- Canon EF-M
- Canon EF-S
- Canon FD
- Canon FL
- Contax N
- Contax/Yashica bayonet
- Contax RF bayonet
- Diana+
- Exakta bayonet mount
- Four Thirds bayonet mount
- Fujica X bayonet
- Fujifilm X-mount
- Hasselblad V-mount
- Konica F-mount
- Konica AR-mount
- M39 lens mount
- Leica M mount
- Leica R bayonet
- Leica S-mount
- M42
- Mamiya bayonet
- Minolta A-mount aka Sony A-mount
- Minolta V-mount (Vectis)
- Minolta SR-mount (MC/MD)
- Miranda bayonet (*all Miranda cameras had a dual bayonet/M44 screw mount*)
- Nikon F-mount
- Nikon S-mount
- Nikon 1-mount
- Olympus OM-mount

### Cinematography

- Aaton universal
- Arri bayonet
- Arri PL
- Arri standard
- B4
- BNCR
- C mount
- Kodak S-mount<sup>[1]</sup>
- CA-1
- PV (Panavision)
- Sony FZ-mount

### Universal (stills and movie)

- Micro Four Thirds system
- Sony E-mount

### Medical

- Minolta SR-mount (MC/MD)
- Olympus OM-mount

### Industrial

- C mount
- CS mount
- Front-plate mount
- T-mount (T-thread)
- Minolta A-mount
- Nikon F-mount
- S-mount (M12 thread)

### CCTV

- C mount

- Pentacon 6/P6
- Pentax K
- Pentax Q
- Rollei QBM Quick Bayonet Mount
- Sigma SA
- Samsung NX-mount
- T-mount (T-thread)
- Topcon (Exakta) bayonet mount
- Yashica AF (MA)
- CS mount
- D mount
- S-mount (M12 thread)

#### Scientific

- C mount
- CS mount

## List of lens mounts

This **list of lens mounts** is ordered by flange focal distance, from shortest to longest. It includes both digital, still photography and movie lens mounts.

OEM model line(s)	Interchangeable type name	Frame size	Camera type	Throat or thread diameter	Mount thread pitch	Mount type	Flange focal distance
Edmund Optics $\mu$ -Video	M6x0.35 to M12x0.5 "board camera" mount/MTV mount	1/6 inch to 1 inch	Security IP Cameras, Automotive Backup cameras, Webcams, Digital Image scanners	6mm to 12mm	0.35 to 0.5 mm pitch	Screw	No Flange. Back focal distance from <1mm to 12mm.
Pentax Q	Pentax Q	1/2.3 or 1/1.7 inch	digital still			Bayonet	9.2 mm
	D-mount	8 mm	movie, CCTV	15.88 mm (0.625 inch)	32 TPI	Screw	12.29 mm
	CS-mount	1/3 inch, 1/2 inch	movie, CCTV, industrial, scientific	25.40 mm (1 inch)	32 TPI	Screw	12.52 mm
	C-mount	1/2 inch, 16 mm, 2/3 inch, 1 inch	movie, CCTV, industrial, scientific	25.40 mm (1 inch)	32 TPI	Screw	17.526 mm (0.69 inches)
Nikon 1 series	Nikon 1 mount	13.2 x 8.8mm	digital still			Bayonet	17 mm
Fujifilm X-Pro1	Fujifilm X-mount	APS-C	digital still			Bayonet	17.7 mm
Canon EOS M	Canon EF-M mount	APS-C	digital still, movie	58 mm (Outer)		Bayonet	18 mm
Sony Alpha NEX	Sony E-mount	35 mm and 23.4 mm $\times$ 15.6 mm APS-C	digital still, movie	46.1 mm (1.815 inch)		Bayonet	18 mm
Olympus Pen & OM-D series; Panasonic G, GF, GX & GH Series, Blackmagic Design Pocket Cinema Camera, Blackmagic Design Cinema Camera	Micro Four Thirds	17.3 mm $\times$ 12.98 mm	digital still, camcorder	$\sim$ 38 mm <sup>A[&gt;]</sup>		Bayonet	19.25 mm
Canon EX			camcorder			Bayonet	20 mm
Bolex	C-mount	16 mm	movie			Breech lock	23.22 mm

OEM model line(s)	Interchangeable type name	Frame size	Camera type	Throat or thread diameter	Mount thread pitch	Mount type	Flange focal distance
Samsung NX	NX-mount	23.4 mm × 15.6 mm APS-C	digital still	42 mm		Bayonet	25.5 mm
Pentax Auto 110		110 film	still			Bayonet	27 mm
Minolta/Leica M bayonet	M-mount (aka EM, VM, ZM)	35 mm	still	44 mm		Bayonet	27.80 mm
Leitz/Minolta CL, Minolta CLE	compact M-mount	35 mm	still	44 mm		Bayonet	27.80 mm
Konica Hexar RF	KM-mount	35 mm	still	44 mm		Bayonet	28 mm (27.80 mm?)
Canon screw mount		35 mm	still	M39	1 mm	Screw	
Leica M39 screw mount	M39 (aka L-Mount, LSM)	35 mm	still, enlargers	M39	26 TPI	Screw	28.80 mm
Narciss		16 mm	still	M24	1 mm	Screw	28.8 mm
Olympus Pen-F		35 mm half-frame	still			Bayonet	28.95 mm
Contax/ (Kiev rf) I, II, III, IIa, IIIa		35 mm	still			Double bayonet	34.85 mm
Contax G		35 mm	still			Breech lock	29.00 mm
Hasselblad Xpan		35 mm panoramic	still			Bayonet	34.27 mm
Nikon Rangefinder	Nikon S-mount	35 mm	still			Bayonet	34.85 mm
Alpa		35 mm	still			Bayonet	37.80 mm
Minolta Vectis	V-mount	30.2 mm × 16.7 mm APS	still			Bayonet	36.00 mm (38 mm?)
Olympus E, Panasonic Lumix DMC-L, Leica Digilux	Four Thirds	17.3 mm × 12.98 mm	digital still	~44 mm <sup>A[<span>&gt;</span>]</sup>		Bayonet	38.67 mm
Aaton universal		16 mm	movie			Breech lock	40 mm
Konica F	Konica F-mount	35 mm	still	40 mm		Bayonet	40.50 mm
Konica A/R	AR-mount	35 mm	still	47 mm		Bayonet	40.50 mm (40.7 mm)

OEM model line(s)	Interchangeable type name	Frame size	Camera type	Throat or thread diameter	Mount thread pitch	Mount type	Flange focal distance
Miranda Camera Company	Miranda bayonet/M44	35 mm and APS-C	still, industrial			Bayonet	41.5 mm
Canon R		35 mm	still			Breech lock	42 mm
Canon FL		35 mm	still			Breech lock	42 mm
Canon FD	FD-mount	35 mm	still			Breech lock	42.00 mm
Fujica-X	Fujica X-mount	35 mm	still	49 mm		Bayonet	43.5 mm
Minolta SR/MC/MD	SR-mount	35 mm	still, medical	44.97 mm		Bayonet (54°)	43.50 mm
Petriflex		35 mm	still			Breech lock	43.5 mm
Mamiya/Sekor E		35 mm	still			Bayonet	43.5 mm
Canon EOS	EF mount (aka ZE)	35 mm	still, movie	54 mm <sup>[2]</sup>		Bayonet	44.00 mm
Canon EOS	EF-S mount	APS-C	digital still	54 mm		Bayonet	44.00 mm
Sigma SA		35 mm	still			Bayonet	44.00 mm
Paxette		35 mm	still	M39	1 mm	Screw	44 mm
Praktica B		35 mm	still			Bayonet	44.40 mm
(Konica) Minolta AF/Alpha /Dynax /Maxxum, Sony Alpha DSLR/SLT	A-mount (aka ZA)	35 mm and APS-C	still, industrial	49.7 mm (1.939 inch)		Bayonet (54°)	44.50 mm
Rolleiflex SL35		35 mm	still	46 mm		Bayonet	44.46 mm
Exakta, Topcon		35 mm	still			Bayonet	44.7 mm
Zenit 39mm	Zenit M39	35 mm	still	M39	1 mm	Screw	45.2 mm
Pentax K	K-mount (aka ZK)	35 mm	still			Bayonet	45.46 mm
Asahiflex		35 mm	still	37 mm	1 mm	Screw	45.46 mm
Praktica	M42 lens mount	35 mm	still	42 mm	1 mm	Screw	45.46 mm
Yashica/Contax	Y/C-mount	35 mm	still			Bayonet	45.5 mm
Mamiya ZE		35 mm	still			Bayonet	45.5 mm
Kyocera Yashica 230 AF etc.	MA-mount	35 mm	still			Bayonet	~45.8 mm
Olympus OM	OM-mount	35 mm	still	46 mm		Bayonet	46 mm
Nikon F-mount	Nikon F-mount	35 mm	still, industrial	44 mm		Bayonet	46.5 mm

OEM model line(s)	Interchangeable type name	Frame size	Camera type	Throat or thread diameter	Mount thread pitch	Mount type	Flange focal distance
Leica R	R-mount	35 mm	still			Bayonet	47.00 mm
Contax-N		35 mm	still			Bayonet	48 mm
Praktina		35 mm	still			Breech lock	50 mm
Tamron	T-Thread (Very earliest type)	35 mm	still	M37	0.75mm	Screw	50.7 mm
Tamron	Adapt-A-Matic	35 mm	still			Bayonet	50.7 mm
Tamron	Adaptall 1 & 2	35 mm	still			Bayonet	50.7 mm
Arri standard		35 mm and 16 mm	movie			Tab lock	52 mm
Arri bayonet		35 mm and 16 mm	movie			Bayonet	52 mm
Arri PL		35 mm and 16 mm	movie			Breech lock	52 mm
Tamron	T2, T-mount or T-thread	35 mm	still, industrial	42 mm	0.75 mm	Screw	55 mm
Sigma Corporation	YS Auto T-Thread	35 mm	still	42 mm	0.75 mm	Screw	55 mm
Tokina	T-thread type	35 mm	still	47 mm	0.75 mm	Screw	55 mm
Sony Mavica	Mavica		digital still			Bayonet	57 mm
Panavision PV mount		35 mm	movie			Breech lock	57.15 mm
Mamiya 7/7II		6×7	still			Bayonet	60 mm (approx.)
Mitchell BNCR mount		35 mm	movie			Breech lock	61.468 mm
Mamiya 645		6×4.5	still			Bayonet	63.3 mm
Zeiss Panflex 5522/23 for Contax rf		35 mm	still			Double bayonet	64.50 mm
Leitz Visoflex II/III		35 mm	still			Bayonet (Leica M)	68.8 mm
Pentax 645		6×4.5	still			Bayonet	70.87 mm
Arri Maxi PL		70 mm	movie	64 mm			73.5 mm
Pentacon Six		6×6	still			Breech lock	74.1 mm
Hasselblad		6×6	still			Bayonet	74.9 mm
Kowa Six/Super 66		6×6	still			breech lock	79 mm

OEM model line(s)	Interchangeable type name	Frame size	Camera type	Throat or thread diameter	Mount thread pitch	Mount type	Flange focal distance
Pentax 6x7		6×7	still			Bayonet	84.95 mm
Leitz Visoflex I		35 mm	still	M39	26 TPI	Screw	91.3 mm
Bronica S2A		6×6	still	57 mm	1	Bayonet	101.7 mm
Rolleiflex SL66		6×6	still			Bayonet	102.8 mm
Mamiya RZ67		6×7	still			Bayonet	105 mm
Mamiya RB67		6×7	still			Bayonet	112 mm
Canon RC-701	Canon SV		digital still			Bayonet	2/3 inch <sup>[3]</sup>

## Legend

### Legend

Column	Description
<b>OEM model line(s)</b>	primary manufacturer(s) or model line(s) with this mount
<b>Interchangeable type name</b>	interchangeable mounts used by multiple camera body and lens manufacturers
<b>Frame size</b>	maximum or typical film format or image sensor size used for this mount
<b>Camera type</b>	still, digital still, movie, cinema, CCTV, ...
<b>Throat or thread diameter</b>	Nominal inside-female or outside-male <i>major</i> diameter (D) with units: inch, mm, or M (ISO 68-1 metric thread pitch mm)
<b>Mount thread pitch</b>	(P) either: (Unified-thread) pitch count/inch, or (metric) mm/thread pitch
<b>Mount type</b>	Bayonet, Breech, Screw, ...
<b>Flange focal distance</b>	Nominal (mm) distance from film or image sensor to lens mount

## Focusing lens mount

The axial adjustment range for focusing Ultra wide angle lenses and some Wide-angle lenses in large format cameras is usually very small.

So some manufacturers (e.g. Linhof) offered special focusing lens mounts, so-called wide-angle focusing accessories for their cameras. With such a device, the lens could be focused precisely without moving the entire front standard.

## Secondary lens mount

Secondary lens refers to a multi-element lens mounted either in front of a camera's primary lens, or in between the camera body and the primary lens.

(D)SLR camera & interchangeable-lens manufacturers offer lens accessories like extension tubes and secondary lenses like teleconverters, which mount in between the camera body and the primary lens, both using and providing a primary lens mount. Various lensmakers also offer optical accessories that mount in front of the lens; these may include wide-angle, telephoto, fisheye, and close-up or macro adapters.

Canon PowerShot A and Canon PowerShot G cameras have a built-in or non-interchangeable primary (zoom) lens, and Canon has "conversion tube" accessories available for some Canon PowerShot camera models which provide either a 52mm or 58mm "accessory/filter" screw thread. Canon's close-up, wide- (WC-DC), and



tele-conversion (TC-DC) lenses have 2, 3, and 4-element lenses respectively, so they are multi-element lenses and not diopter "filters".

## Notes

**^ A:** The authoritative normative source for 4/3 standards information is Four-Thirds.Org and not 3rd-party reviews.

4/3's published facts:

- "Size of the 4/3-type Sensor: The standard diagonal length of the sensor is 21.63 millimetres (0.852 in). It is half that of 35-mm film format (36 millimetres (1.4 in) x 24 millimetres (0.94 in) = 43.27 millimetres (1.704 in)) The image circle of the interchangeable lens is specified based on this diagonal length. The focal length is about a half that of a 135 film camera lens assuming the same angle of view."<sup>[4]</sup>
- "The foundation for the high picture quality of the Four Thirds system is the lens mount, which is about twice the diameter of the image circle."<sup>[5]</sup>
- "Differences between Four Thirds System mount and Micro Four Thirds System mount: Mount diameter reduction; As a result of research aimed at facilitating the design of compact, lightweight lenses while maintaining the current strength, the outer diameter of the lens mount has been reduced by approx. 6 millimetres (0.24 in). ... the Micro Four Thirds System ... specifies the optimum flange back length required to reduce camera size and thickness, assuming the omission of the mirror box. The flange back length has been reduced to about 1/2 that of the Four Thirds System."<sup>[6]</sup>

So:

- $21.63\text{mm} * 2 = 43.26\text{ millimetres (1.703 in) or } \sim 44\text{mm}$
- $43.26\text{mm} - 6\text{mm} = 37.26\text{ millimetres (1.467 in) or } \sim 38\text{mm}$
- $(21.63\text{mm})^2 = ((17.3\text{mm})^2 + (12.98\text{mm})^2)$ ; See: Pythagorean theorem ( $5^2 = 4^2 + 3^2$ )

NOTE: Some published reviews of 4/3 instead cite the (female) "outside diameter" of the lens or mount as ~50mm (and micro-4/3 as ~44mm),<sup>[7]</sup> and not the appropriate *major* diameter (D) ~44mm which is the camera body's female mount inside-diameter and the lens's male mount outside-diameter (micro-4/3 ~38mm).

## See also

- ISO metric screw thread
- Lens board

## References

1. <sup>^</sup> "S Mount Movie Lenses (Cine-Kodak Special II Camera & Others)" (<http://www.jimscamerasseattle.com/smomole.html>). Jimscamerasseattle.com. Retrieved 2013-04-22.
2. <sup>^</sup> "Camera Story - 1987-1991 EOS" ([http://www.canon.com/camera-museum/history/canon\\_story/1987\\_1991/1987\\_1991.html](http://www.canon.com/camera-museum/history/canon_story/1987_1991/1987_1991.html)). Canon. Retrieved 2008-07-22.
3. <sup>^</sup> Digital Compact Cameras - RC-701 SLR Type Still Video Camera ([http://www.canon.com/camera-museum/camera/dcc/data/1986-2000/1986\\_rc701.html?lang=us&categ=crn&page=1986-2000](http://www.canon.com/camera-museum/camera/dcc/data/1986-2000/1986_rc701.html?lang=us&categ=crn&page=1986-2000)), Canon Camera Museum
4. <sup>^</sup> "About Four Thirds, Standard, Whitepaper (Summary of Standard)" (<http://www.four-thirds.org/en/about>

/standard.html). Four Thirds System. Retrieved 2008-08-11.

5. ^ "About Four Thirds, Standard, Benefits of Four Thirds" (<http://www.four-thirds.org/en/about/benefit.html>). Four Thirds System. Retrieved 2008-08-11.
6. ^ "Micro Four Thirds, Standard, Whitepaper (Summary of Standard)" (<http://www.four-thirds.org/en/microft/whitepaper.html>). Four Thirds System. Retrieved 2008-08-11.
7. ^ "Olympus and Panasonic announce Micro Four Thirds" (<http://www.dpreview.com/news/0808/08080501microfourthirds.asp>). Digital Photography Review.

## General references

- Markerink, Willem-Jan. "Camera mounts & registers" (<http://www.a1.nl/phomepag/markerink/mounts.htm>).

## External links

- SLR Mount Identification Guide ([http://members.tripod.com/rick\\_oleson/index-99.html](http://members.tripod.com/rick_oleson/index-99.html))
- Standard: GOST 10332-72 (in Russian) — M42×1/45.5, M39×1/28.8 (<http://www.zenitcamera.com/qa/qa-gost10332-72.html>)
- Standard: GOST 10332-63 (in Russian) — M39×1/45.2 (aka «Z39»), M39×1/28.8, bayonet «C» (cameras: «Zenit-5», «Zenit-6», «Zenit-7»), bayonet «Zenit-7» (<http://www.zenitcamera.com/qa/qa-gost10332-63.html>) (in Russian)
- Camera mounts & registers from Robert Monahan Medium Format Photography Megasite <http://medfmt.8k.com/>
- Camera mounts & registers from Willem-Jan Markerink <http://www.markerink.org/WJM/HTML/mounts.htm>
- Camera Mounts Sorted by Register (<http://www.graphics.cornell.edu/~westin/misc/mounts-by-register.html>)
- Alphabetical List of Camera Mounts (<http://www.graphics.cornell.edu/~westin/misc/mounts-alphabetical.html>)
- Nikon Lens Nomenclature - a study in frustration (<http://www.nikonlinks.com/unklbil/nomenclature.htm>)
- Adaptall-2.com (<http://www.adaptall-2.com/>)
- Mechanical & Optical Instruments (<http://www.kineoptics.com/camera.html>)
- DPreview Hands-on preview of Fujifilm X-Pro1 (<http://www.dpreview.com/previews/fujifilmxpro1/>)
- DPreview Hands-on preview of Canon EOS M (<http://www.dpreview.com/previews/canon-eos-m/>)

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