

Binocular Sky Review: Helios LightQuest-HR 25x100

Manufacturer's Specification

Weight (g)	3990
Field of View (°)	2.7
Eye Relief (mm)	16
IPD (mm)	56-74
Waterproof	Yes (IPX7)
Prism Type	Porro
UK Guarantee	Not specified
Origin	China
Body Material	Magnesium Alloy
Armour Type	Textured rubber
Nitrogen Gas Filled	Yes
Prism Material	BaK4
Prism Coating	Multi-coated
Lens Coating	Fully multi-coated
Eyecup Type	Fold down



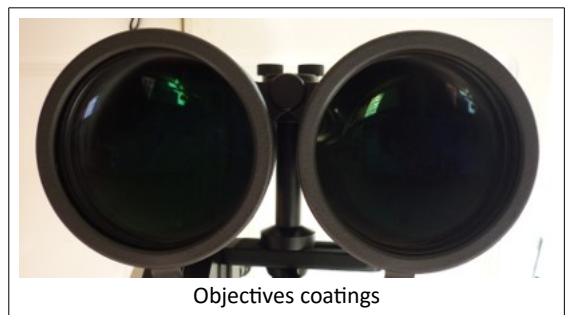
Price: £629

Available from: [First Light Optics](#)

Initial Impressions

The binocular is of Bausch&Lomb (aka “American”)-type construction, i.e. the objective tube is integral to the prism housing. There is a very sturdy central mounting bar. It has the same prism housing as the 20x80 model in the same range. This has fixing points for a neck strap – slightly odd for a 4kg binocular! I suppose one of them could act as a tether point for the eyepiece covers.

The binocular is covered in a synthetic rubber-type armour, which gives a secure grip with or without gloves and also when the binocular is damp with dew. The individual eyepiece focusing is smooth, with no “stiction” and is sufficiently stiff to prevent accidental refocusing, especially when folding down the eye cups. There is a large knurled ring on each eyepiece; this makes it easy to focus with gloved fingers. The hinge is smooth and tight enough not to accidentally slip once it is adjusted or when you are adjusting the focus. The eye-cups fold down quite easily.



Objectives coatings



Proper prism cage

The prisms are housed in a proper “cage” and are not merely held in place with clips. They do not appear to be grooved on their hypotenuses.

The coatings look very good and reflect only a small amount of light (blue-green dominant). The insides of the objective tubes are ribbed along their entire length, suggesting that control of stray light should be good. There are no cut-offs in the light path, suggesting that the prisms are adequately sized.

The binocular is supplied with a lockable rigid case with a die-cut recess in the foam, for the binocular. The tethered plug-in

type objective covers are a good fit, and do not come off accidentally as long as they are put properly in place. The eyepieces have a tetherable (left hand side) double rainguard-type cover that fits securely. It does not restrict the interpupillary distance when it is in place. However, there is no strap on which to tether the eyepiece covers, although it would be a simple matter to tether them to a neck-strap lug with a piece of cord.



The binocular is also provided with a very substantial metal post-type tripod adaptor that clamps to the mounting bar, where it is secured with two knurled thumb-screws. These are just large enough to be operated with thin-to-medium gloves, but not with thick ones. The bottom of the post is threaded with $\frac{3}{8}$ -inch Whitworth mounting hole. A $\frac{1}{4}$ -inch adaptor is thoughtfully included, so that the mounting post will mate with a variety of mounting options.



Testing the Specifications

As you would expect with a binocular of this quality, the aperture is the full 100mm and is not internally stopped. Examination of reflections when a bright light is shone down the objective end confirms the fully multi-coated spec. The eyepiece coatings reflect very little light. There are no grey segments in the exit pupil, confirming that the prisms are of high-index glass. I measured the

minimum interpupillary distance at 56 mm. The eye cups are 46 mm diameter, so there is 10 mm between them at their closest; this should accommodate most people's noses. The objective lenses are recessed 17 mm into their barrels, offering very good protection against accidental touching, but insufficient for dew protection. With fully-corrected vision, the eyepiece dioptres are set close to zero when you focus to infinity, suggesting that they are properly adjusted. There is a nominal 10-dioptre adjustment available either side of this, so the binocular could be used without spectacles by people with moderate to strong myopia or hyperopia/presbyopia. For those who do need spectacles, the eye lenses are recessed 3mm into their housings so, with the eye-cups folded down, there is 13mm of the specified 16mm eye relief available. I found this to be only just adequate to enable the entire field of view to be visible when I was wearing spectacles, so potential users who need to observe with their glasses on should ascertain that it is adequate for them.

Under the Stars

For testing, which involved a comparison with other binoculars in the LightQuest-HR range, I mounted it either on a [Universal Astronomics T-mount](#) (parallelogram) or a Skywatcher AZ4 altazimuth mount. I compared this to [16x70](#) and [20x80](#) versions of the same binocular. My observing site is in a reasonably dark suburban location.



Collimation was, as far as I could ascertain, perfect. The field of view just contained Orion's belt (2.73°), which is consistent with the specified field of 2.7° . The view is sharp and flat over the central 70% of the field, but is affected by slight field curvature outside this. I could distinguish four Trapezium (*θ Ori*) stars when it was just 12° above the horizon; all four were distinguishable in the central 80% of the field of view, with three still distinguishable to 90%. It was at the 80% point that Betelgeuse began to flare somewhat. There was noticeable vignetting in the outer 5% or so of the field of view. Control of false colour (chromatic aberration) is good but not perfect on axis, but becomes noticeable on bright objects (e.g. Venus or the lunar limb) once they are off-axis, although it is still quite well-controlled, considering the aperture and the focal ratio, here. Colour correction is very sensitive to eye positioning, so you do need to ensure your eyes are on-axis to get the best of this.

There is an unobtrusive amount of pincushion distortion, just sufficient to eliminate the nauseating "rolling ball" effect that can occur without it. Control of stray light from objects in the field of view is very good but when the Moon was to the side and below the field of view, I noticed the same ghost images of the Moon, with 45° streaks extending either side, that I could see in the 20x80, although they were neither as bright nor as pronounced in the larger binocular. The angle suggests that they are produced by prism edges. These spurious reflections were only just apparent with Sirius in a similar position, but I could not detect them on Betelgeuse or Arcturus.

"...the Perseus Double Cluster was simply stunning..."

Colour rendition was very faithful and, probably due to the greater aperture than the smaller binoculars in the range, seemed slightly more vibrant in the 25x100. As you would expect, globular clusters like M3 and M53 were distinctly larger and brighter than in the smaller glasses. With direct vision, M51 was clearly two different, but connected, discs which showed core condensations. M101 was an easy object and the Virgo-Coma cluster of galaxies was full of grey smudges that multiplied and brightened under averted vision.

The stars of Stock 2 (the Musclemans Cluster) were crisp and very nicely framed, but the Perseus Double Cluster was simply stunning in this binocular. In fact the Cassiopeia/Perseus region was a sheer delight, full of clusters that almost jumped out of the sky to greet you, and I spent a lot of time just enjoying this.

Jupiter showed equatorial bands and pinpoint Galilean moons when it was near the centre of the field of view.

Conclusions

The 25x100 member of the Helios LightQuest-HR range is a lovely binocular for low magnification Deep Sky astronomy. I usually observe at 37x with my 100mm binoculars, but the [Helios LightQuest-HR 25x100](#) reminded me of the pleasures of observing at lower magnification (and greater field of view) with large glasses. I imagine that someone using 100mm binoculars for the first time would be stunned by what they reveal of the Deep Sky.

Compared to the 16x70 version especially, it is less sharp the outer part of the field of view and it suffers from noticeably more chromatic aberration; this is due to it having a relative aperture of about f/4 as compared to the f/5 of the 16x70. No achromat is truly achromatic at f/4, and it gets less achromatic as aperture increases – for a 100mm achromat to give equivalent colour correction to a 70mm f/5, it would need to have a relative aperture in excess of f/7; this would make the binocular significantly heavier and nearly twice as long.

This is a heavy binocular and, if you are considering it, you need to consider how you will mount it. Don't be fooled by advertised carrying capacities of photographic tripod-head arrangements. For example, the *Amazon Basics tripod with a trigger-grip (aka joystick) head* claims to be able to carry 5kg; this is hopelessly optimistic for a binocular that will be used to view at high elevations; it is simply inadequate for the 4kg binocular. I also tried a *Manfrotto 475 tripod with a 501 head*. The was acceptable, but did require repeated adjustment of the altitude tension; increasing it as the turning moment of the binocular increased with increasing target altitude. The *Skywatcher AZ4* was more tolerable, mostly because the tension is adjusted with the handle, but it is too short for anything other than seated observing, which brings a cluster of legs (yours, your stool's and the tripods) into competition for the same bit of spacetime. I found that the only really pleasurable mount was a sturdy parallelogram.

Binocular Sky Ratings (/10)	
Sharpness of Image	10
Size of usable field	7.9
Colour Correction	7
Control of stray light	8
Eye relief	8
IPD	9
Overall Optical Quality	8.3
Focus mechanism	10
Eye cups	8
Hinge	10
Armour	10
Overall Mechanical Quality	9.5
Case	7
Neck-strap	10
Objective caps	10
Eyepiece caps	10
Value for Money	9
Overall	9

Given the sheer pleasure that the [Helios LightQuest-HR 25x100](#) gives, it is a very good option for a serious 100mm binocular. Stray light control is slightly better than in the 80mm version, and image sharpness was comparable. I have used less expensive alternatives in the past, and none was as good as this with regard to size of usable field, false colour, and stray light control. For this reason, I would rate it as very good value for money in a high-end, individual eyepiece focusing, straight-through, astronomical binocular.

Stephen Tonkin
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