Andres Industries AG

defence is a human right

2024 CATALOG

Thermal imaging devices Made in Germany

We develop and produce our thermal imaging devices in Germany. This is the only way we can guarantee high precision and quality. All customers are welcome to pick up their devices personally at our Berlin production facility and combine this with a factory tour. It is important to us that our technology can be used with maximum success in both hunting and governmental operations. Therefore, we offer our present and future customers the opportunity to participate in our thermal imaging and night vision workshops. Our staff will also be happy to visit you on site at your agency or hunting organization.

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The perfect solution for every requirement

Pistol

If the TILO-3 is worn as goggles, it can even be used with normal pistols at short distances of up to 20 meters. (pp. 27)

TILO-3M

PDW

In combination with the Red Dot Flipper, the TILO-6MA can even be used as clip-on thermal in front of short reflex sights on PDW. (pp. 33)

TILO-6MA

AR

If a long range is not required, AR with Battle Sights like the ELCAN Specter 1x/4x, which have 1x magnification, can be used in combination with the TILO-6MA to create extremely lightweight and compact solutions. (pp.31)

The PumIR was specially developed for use on AR. It offers the perfect combination of compactness and range. (pp. 12)

The PumIR is a good choice for medium distances on MG, its short design makes it suitable for almost all models. (pp. 12)

PumIR

The TigIR is the right choice for AR if it is to be used in front of a reflex sight or if a particularly long range is required. (pp. 18)

MG

The TigIR is used thousands of times on the MG, as it can also be used for reconnaissance and coverage at greater distances. It can also be mounted on almost any machine gun thanks to its short design in combination with the ELCAN Specter. (pp. 22)

TigIR

The TigIR was developed specifically for use on DMR weapons. It can be used well in front of scopes with 3x magnification, as is common on DMR weapons. (pp. 18)

DMR

If the PumIR is used with the Afocal Lens, it is also ideally suited for use as a thermal clip-on on DMR weapons. It delivers a perfect image even for scopes with 4x magnification. The attachment lens can be removed within seconds, enabling CQB use. (pp. 15)

PumIR with Afocal Lens

Sniper

The new BealR is a cost-effective alternative for cooled thermal sniper clip-on devices. It has an optional laser rangefinder and dual field of view optics, which also has a wide-angle mode. The maximum detection range is 5km. (pp. 8)

BealR

Our products

All of the devices developed by us in Berlin have unique features that have proven themselves in the field. For example, we were the first to develop a thermal imaging device with automatic flap control. In addition, the sub-pixel collimation we introduced has revolutionized the precision of clip-on thermal imagers. Many of these innovations have been inspired by direct interaction with users. We will continue to listen to our customers' needs in the future. On the following pages you will find a description of the features that can be found in our devices exclusively.

Automatic flap control

All our thermal imaging devices are equipped with the patented automatic flap. When the lens flap is opened, the thermal imager switches on automatically. When it is closed, it switches off. So you can never forget to switch off the device after use. The flap can also be used for particularly accurate calibration of the thermal imaging sensor. This also works with devices that already have an automatic shutter. Should the flap be damaged during use, switching the device on and off can also be done by pressing a button. With our new PumIR clip-on thermal imager, the flap can even be removed and replaced by a collimatable 2x afocal lens. Actuating the flap during operation also deactivates the automatic internal shutter and thus ensures silent operation.

3 level concept

Have you ever been annoyed with having to enter the menu for the simplest settings? All our thermal imagers can be operated intuitively via three levels:

1. Level: Simply open the flap and get started. The device starts with the last selected settings. You do not need to press a button.
2. Level: You can access more advanced functions, like zoom, filter selection and brightness by using two buttons only without having to switch to a menu.
3. Level: Only here you reach the settings menu, where the collimation e.g can be set.

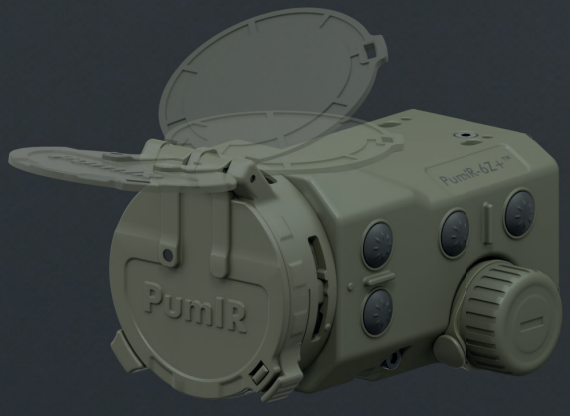


Illustration of the automatic flap control

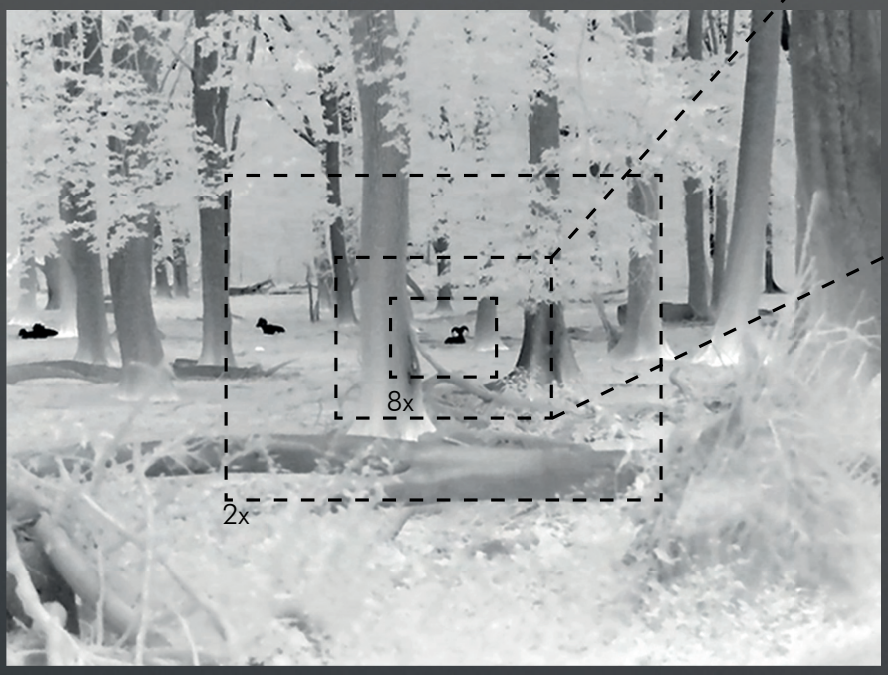
High precision

Our devices offer a precision which is approx. 100% higher than conventional clip-on thermal imagers. The high quality manufacturing technology of the housing contributes to this. It is milled from a block of high-strength aluminum for each device and is robust enough to withstand acceleration forces of up to 1,200g. Our experience shows that other techniques, such as die casting, do not achieve the repeatability in the field that our customers demand from us. However, AI upscaling and sub-pixel collimation have the greatest impact on the outstanding precision of our devices. With these features, we get twice the performance out of the microbolometer we use. For example, the TigIR achieves groups of a scattering circle of 6cm at a shooting distance of 500m, although the sensor-related angular resolution at this distance is already beyond 10cm.

AI upscaling

This feature is more than just a simple edge smoothing. With the help of an AI algorithm, the sensor image is vectorized at digital zoom, reinterpreted and displayed in higher resolution on the display. Even at 8x digital magnification, individual pixels are barely visible. This results in a sharper, but above all, high-resolution image.

For this reason, we also recommend using the digital zoom levels when used as clip-on thermal imagers, as they can significantly increase the range.

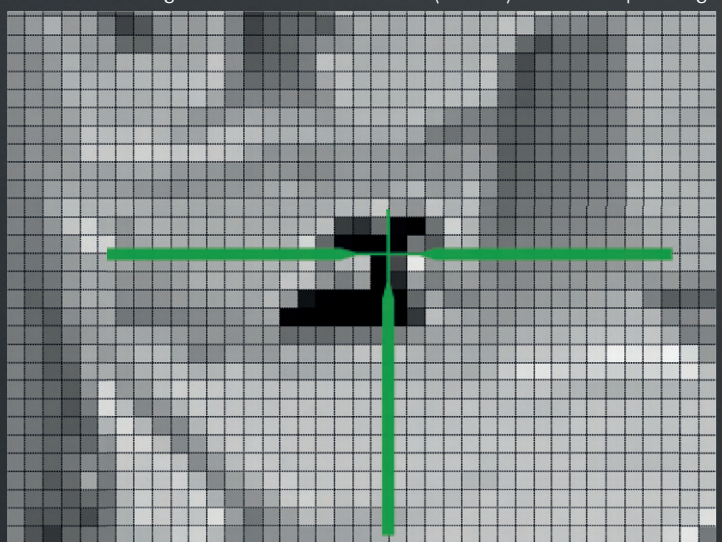


Sensor information 4x digital zoom

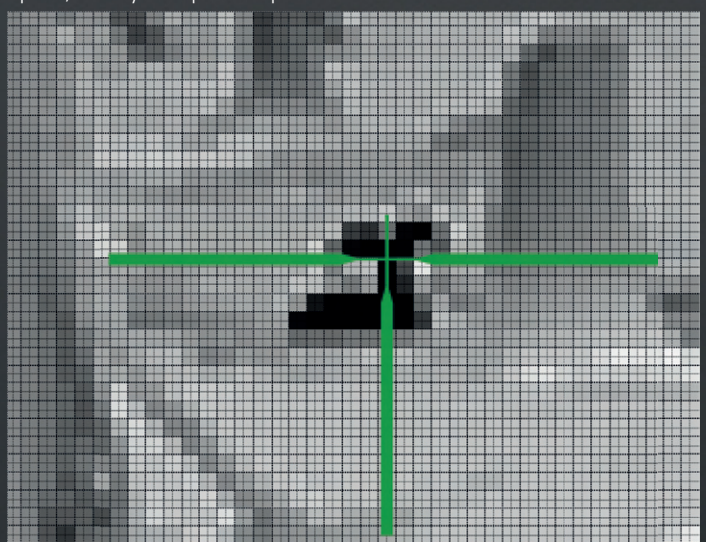
Screen display after AI upscaling

Sub-pixel collimation (SPC)

The AI upscaling described above only leads to increased precision if the thermal imager can also be collimated (zeroed) with corresponding precision. Therefore, our devices can not only be collimated pixel by pixel, but by half pixel steps.



Step size for collimation in conventional thermal imagers



Smaller step size for BeaIR, TigIR, TILO and PumIR

Thermal filter palettes

All our devices have 15 different thermal filters. The sensor signal is processed differently and displayed according to application requirements of the users. In the settings menu, the users select which of the filters they want to activate for use.

Tactical filters

tactical filters display heat differences in monochrome brightness gradients. Thus a largely natural representation is possible.

Black Hot

Boost Black Hot

Cold Red

Boost Cold Red

As before, but in red. This tactical filter reduces the glare effect and is preferably used at night.

Cold Green

Boost Cold Green

Comparable to the CR filter, but in green. Any stray light that may escape is harder to be detected by enemy image intensifiers.

White Hot

Boost White Hot

Heat sources are displayed brightly. This allows the reticle to become more visible when the device is being used as a clip-on thermal imager.

Red Hot

Boost Red Hot

Similar to the WH filter, but in red. This filter has the least glare when used at night, as only the heat sources are illuminated.

Boost mode

Each tactical filter is also available in a boost version. The dynamic range distribution is optimized similar to an HDR image. This makes many more details visible that only have ambient temperature.

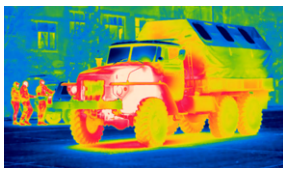
Heat sources such as people and trees are displayed dark. The picture is more natural, allows easier orientation.

Technical filters

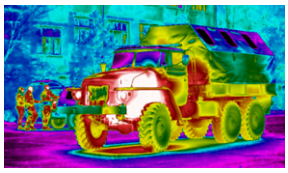
The technical filters represent the temperature differences in a special way. They can be used to evaluate the insulation of buildings, e.g.

Hottest

Ironbow



Rainbow



Rainbow HC

Glowbow

Rusan adapters

With the Rusan product line, Mikron offers over 50 different adapters that allow night vision and thermal imaging devices to be mounted in front of a variety of cameras and spotting scopes. For the selection of the correct Rusan adapter, it is important to measure the outer diameter of the optics accurately, since the manufacturer's specifications are often inaccurate.
For the TigIR, the Rusan adapters with M52x0.75 thread can be screwed directly to the housing. For the PumIR, adapters with M35x1 thread fit are to be used.

Even our small TILO thermal imaging goggles can be mounted in front of an optic using the TILO Rusan adapter (see p. 37) in combination with the actual Rusan adapter.

„Präzise Jagen" adapter

Much more repeatable and thus significantly more precise than the Rusan system are the adapters from „Präzise Jagen" - developed and manufactured in Germany. The high precision results from the two-part design consisting of a clamping sleeve, which is mounted on the target optics, and a duo adapter for the respective thermal device. Through the patented bayonet system the clip-on device is always mounted in exactly the same position, thus being a precise interface. With this option, the zoom levels of our thermal imagers TigIR, PumIR and TILO can be used with repeatable precision.

Duo adapter for PumIR™ I Art. Nr. 388813
Connects a PumIR™ with a scope along with clamping sleeve.

Duo adapter for TigIR™ I Art. Nr. 388815
Connects a TigIR™ with a scope along with clamping sleeve.

Rusan adapter M52x0.75, suitable for TigIR-6Z+				Rusan adapter M35x1, suitable for PumIR		Präzise Jagen clamping sleeves	
Djameter in mm	Order number	Djameter in mm	Order number	Djameter in mm	Order number	Djameter in mm	Order number
30	382023-1	57	382023-25	30	384000-30	30	388830
30 SR	382023-2	57.5	382023-26	47	384000-47	34	388834
34	382023-3	58	382023-27	48	384000-48	36	388836
36	382023-4	58.4	382023-28	50	384000-50	38	388838
36 ZM	382023-5	59	382023-29	54	384000-54	48	388848
38	382023-6	59.5	382023-30	56	384000-56	49	388849
40	382023-7	60	382023-31	57	384000-57	50	388850
41	382023-8	60.5	382023-32	58	384000-58	51	388851
42	382023-9	61	382023-33	58.4	384000-58.4	52	388852
42.5	382023-10	62	382023-34	59	384000-59	53	388853
44	382023-11	62.7	382023-35	60	384000-60	54	388854
46	382023-12	63	382023-36	62	384000-62	56	388856
46.7	382023-13	63.5	382023-37	63	384000-63	57	388857
47	382023-14	64	382023-38	63.5	384000-63.5	58	388858
48	382023-15	64.5	382023-39	64	384000-64	59	388859
49	382023-16	65	382023-40	65	384000-65	59.5	388859.5
50	382023-17	66	382023-41	67	384000-67	61	388861
51	382023-18	67	382023-42	69	384000-69	62	388862
52	382023-19	68	382023-43			63.5	388863.5
53	382023-20	69	382023-44			64	388864
54	382023-21	71	382023-45			64.5	388864.5
55	382023-22	72	382023-46			65	388865
56	382023-23	80	382023-47			67	388867
56.7	382023-24						

The scope of delivery is constantly being expanded. We will be happy to inform you whether the size you require is available.

BeaIR™

Uncooled Thermal Long Range Scope

Announcement

The BeaIR™ offers the range of a cooled thermal scope at the size and price of an uncooled thermal scope. With a length of only 14cm and a weight of 700g, the BeaIR™ is no larger than standard uncooled thermal imaging systems. Nevertheless, with its special optics and integrated AI image processing, it is capable of achieving a detection range of 5000m (upright standing man). In addition, the BeaIR™ features a dual-field-of-view (DFOV) optics. This means that the optic can not only be operated in 100mm/4.3° long range mode, but also provides a wide angle mode of 11°, which gives the shooter an excellent overview. This extreme compactness combined with the great flexibility is made possible by the use of a 20mK sensitive microbolometer.

A laser range finder (LRF) in the SWIR range with a range of up to 4,500m is available as an optional accessory. Via a USB/Bluetooth interface, individual ballistic data can be played to the device.

Figure similar

BeaIR™ features

Optional:
SWIR Laser Range Finder for distances up to 2.5km. Reliably protected against scratches with sapphire crystal.

DFOV-Optics:
switchable between 4,3° und 10° optical FOV.
The dark DLC coating provides maximum protection against scratches and prevents conspicuous reflections.

Lens protection flap interchangeably connected to the housing. Has the typical function for our devices for switching the device on and off.

The cover can be exchanged for special variants according to customer requirements. E.g. Killflash etc.

BT, BL and GPS are also integrated in the top of the BeaIR with LRF.

EMO-Button:
-change zoom ratio
-adept fokus
-menu selection

4 rubber control buttons

Waterproof connector
-Video-out
-Power in
-Remote control

Eratec adapter with either one or 2 locking levers for use on weapons up to .50 BMG incl. adapter plates for any height adjustment.

M35 connection to mount directly in front of an Optical Scope

Like the objective lens, the eyepiece also has a FOV of 4.3°. This gives the BeaIR-20 a total magnification of 1x with a resolution of 1920 pixels horizontally.

Two battery compartments enable hot swap exchange of the 18650 cells during operation. Alternatively, CR123 batteries can be used.

BeaIR-20, the dedicated Clip-on for Snipers

The BeaIR-20 is the clip-on thermal that snipers have always been waiting for. It displays the sensor image in the eyepiece at a particularly small 4.4°. This means it can be optimally viewed with particularly powerful sniper scopes. The image is extremely sharp and completely visible even for riflescopes whose smallest magnification starts at 5x. Even scopes that start at 8x still produce a very sharp image. Thanks to the high quality of the screen, which has a total of 2560 pixels, there are also sufficient reserves to allow the optical zoom of the riflescope to be used. It is therefore no problem at all to zoom in up to a factor of 20x. If the sensor is operated in tele mode, i.e. with a field of view of 4.4°, the total system magnification is also exactly 1x. This means that all markings on the reticle of the riflescope remain valid and nothing needs to be recalculated. In addition to the typical clip-on functions such as pixel shift and sub-pixel collimation, the BeaIR-M20 of course also has all the functions for use as a dedicated thermal imaging riflescope, such as programmable crosshairs and BT connection to ballistics computers such as the Kestrel and similar.

Screen cutouts at different magnifications.

The Bear-20 is also particularly suitable for high magnification scopes. Even at 3x magnification, practically the entire sensor image is visible.

To ensure that overlay information is clearly legible at any magnification, the shooter can set how centrally it is displayed. It is also possible to display them in several places at the same time.
With the maximum display resolution of up to 2560 pixels, there are enough reserves even at high magnifications.

Technical data BeaIR™ (preliminary data)

Model	BeaIR-M20x5™	BeaIR-Z20x5™	BeaIR-M20™	BeaIR-Z20™	BeaIR-M20x5LRF™	BeaIR-Z20x5LRF™	BeaIR-M20LRF™	BeaIR-Z20LRF™
Order number	nn	nn	240801	240800	nn	nn	240802	nn
User group	authorities only	civil use	authorities only	civil use				
Reticle	6 standard, OEM on request	-	6 standard, OEM on request	-	6 standard, OEM on request	-	6 standard, OEM on request	-
LRF	-				SWIR Range: 2500m			
Microbolometer resolution	640x512 (60Hz), 20mK							
Zoom (digital)	5x, 10x, 20x, 40x		1x, 2x, 3x, 4x, 6x, 8x		5x, 10x, 20x, 40x		1x, 2x, 3x, 4x, 6x, 8x	
Focal length	DFOV 40mm/100mm							
Spectrum/Pixel pitch	7.5–12.5 μm / 12 μm uncooled microbolometer							
FFC (calibration modes)	internal mechanical shutter (switchable) + software calibration (NUC) + manual calibration via front flap							
FOV Sensor	WFOV: 11°, NFOV:4,4°							
FOV Eyepiece	20°		4,4°		20°		4,4°	
Display (px)	2560x2048		1920x1536		2560x2048		1920x1536	
System Magnification	WFOV: 2X NFOV: 5X		WFOV: 0,23X NFOV: 1X		WFOV: 2X NFOV: 5X		WFOV: 0,23X NFOV: 1X	
Compatible ballistics computers	Kestrel, others in progress or available on request.							
Sunlight sensitivity	harmless							
Angle resolution (pixel size at 100m)	WFOV: 0.03 MOA (3cm) NFOV: 0.012 MOA (1.2cm)							
Use as a clip on device	for optics with1x (optimum) - 2x magnification		for optics with4x (optimum) - 8x magnification		for optics with1x (optimum) - 2x magnification		for optics with4x (optimum) - 8x magnification	
Operating time 4xCR123	ca. 3h (hot swap mode) ca. 5h (long live mode)							
Operating time 2x 18650	ca. 4h (hot plug mode) ca.6h (long live mode)							
Temperature range	in operation: –30° to +50°C in storage: –40° to +80°C							
Dimensions (without accessories)	L: 142mm; W: 85mm; H: 85mm				L: 142mm; W: 85mm; H: 103mm			
Weight (without accessories/battery)	690g				750g			
Water resistance Shock resistance	IP68 MIL-STD-810G (CHG 1) 510.6 Sand and Dust: Procedure 1 & Procedure 2 MIL-STD-810G (CHG 1) 506.6 Rain: Procedure 1 & Procedure 2 & Procedure 3 MIL-STD-810G (CHG 1) 516.7 Shock: Procedure 1 & Procedure IV MIL-STD-810G (CHG 1) 519.7 Gunfire Shock: Procedure 2 – Kaliber7, 62x51 mm NATO (3600J), Firing sequence 250x40 @ 650-800/min mounted onto Picatinny rail MIL-STD-810H 501.7 High Temperature: Procedure 1 & Procedure 2 MIL-STD-810H 502.7 LowTemperature: Procedure 1 & Procedure 2 MIL-STD-810H 503.7 Procedure 1-D Temperature Shock							
Material	Aircraft grade aluminum (hard anodized and scratch-resistant ceramic-coated)							

PumIR™ – The Modular Talent

Range extendable to 4000m with afocal lens

With a total length of 10cm, it is certainly much smaller than the TigIR, but in combination with the matching afocal lens the device achieves a 30% higher range of 4km. This compact combination of high range and low weight (approx. 500g) is unique worldwide. Due to its low profile design, it combines well with tactical scopes that have a reflex sight on top, such as the Trijicon 4x32 ACOG with RMA. Of course, the PumIR series has all the unique features of thermal imagers developed by Andres Industries.

Integrated lens cover with the following functions:
- switch on/switch off
- manual calibration
- 90° rotatable to mount a reflex sight
- removable
- protection of objective lens

High performance thermal imaging sensor with 640x512 pixels, <40mK thermal sensitivity and 36mm f/1.0 lens. Like all our thermal imaging systems, the PumIR is only available with 60Hz sensors

ERATAC mount with safety lock and the ability to adapt to various Picatinny rails (PumIR-M/PumIR-M.5)

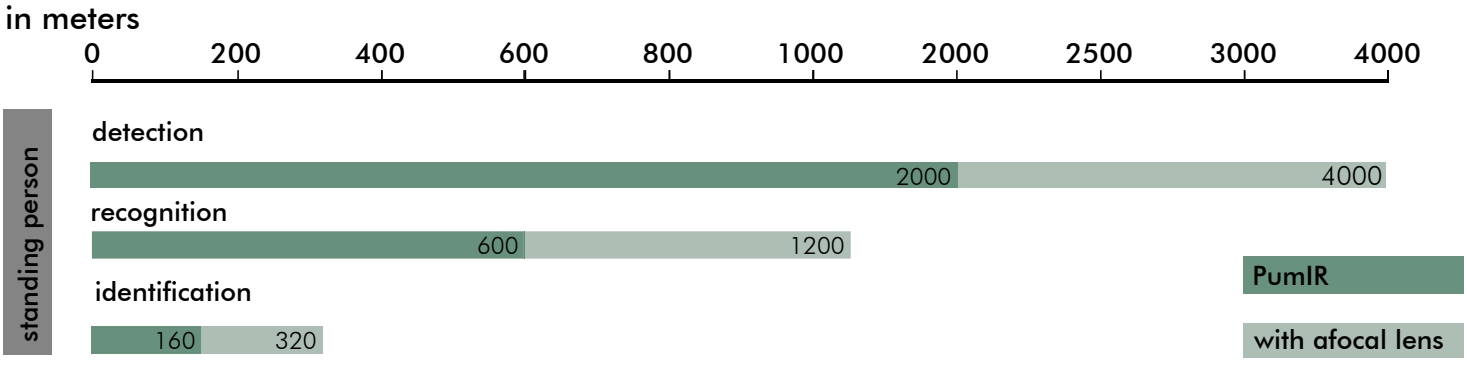
PumIR-M20™

4 waterproof rubber buttons for controlling the thermal imaging functions and changing the thermal filters

Waterproof battery compartment for 2 CR123 batteries or one rechargeable battery (18650) allows a runtime of up to 8 hours

Data Sheet page 17

Ranges of the PumIR™ models



PumIR™ features

Platform to mount reflex sights e.g.

M35x1 thread for mounting adapters directly

Eyepiece optics for cameras and scopes with 2-4x magnification

Adaptable to different axis heights of riflescopes by means of tripod rails
(PumIR-6M/ PumIR-6M.5)

Waterproof case made of hard anodized, ceramic coated aerospace aluminum filled with nitrogen

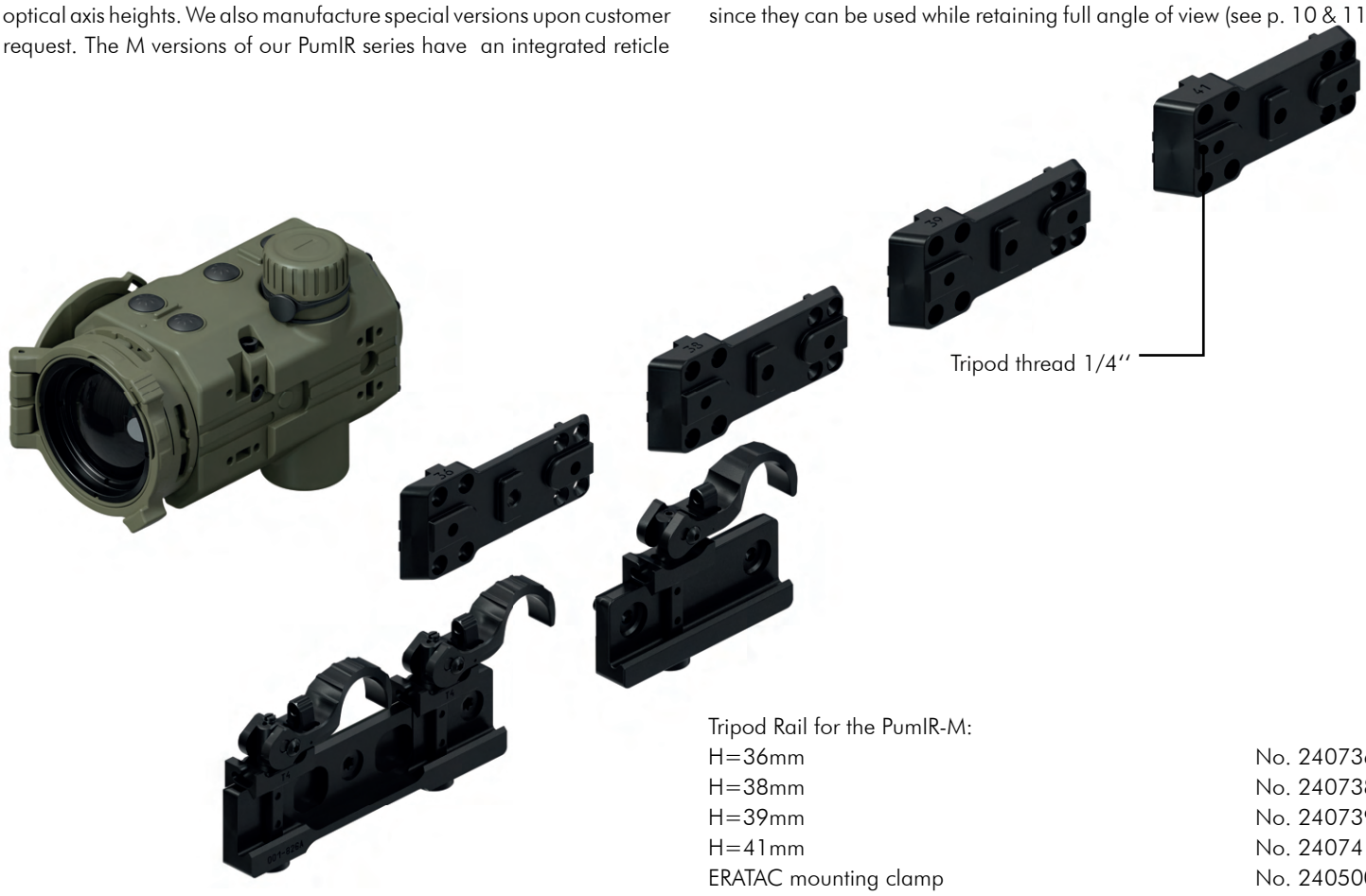
Waterproof interface connector for:
- digital video output
- external power supply
- remote control

PumIR-Z™ – The Civil Version

The civilian version of the PumIR is also ideally suited for hunters and civil use. Like the civil version of the TigIR, the PumIR can be mounted in front of a wide variety of optics using Rusan adapters and „Präzise Jagen“ adapters. Due to its large field of view, it can also be used as a handheld device for observation. It can also be mounted on tripods using the appropriate rails.

PumIR-M™ series

The PumIR-M is designed for military users where the device can be mounted directly to firearms (STANAG rail) using the high precision ERATAC mount. With different Tripod Rails the PumIR can be adapted to different optical axis heights. We also manufacture special versions upon customer request. The M versions of our PumIR series have an integrated reticle ex factory, meaning the PumIR can be used directly as a thermal aiming device. Especially military users appreciate the advantages of the PUMIR-M.5 in combination with tactical target optics with 4x magnification, since they can be used while retaining full angle of view (see p. 10 & 11).



Tripod Rail for the PumIR-M:	
H=36mm	No. 240736
H=38mm	No. 240738
H=39mm	No. 240739
H=41mm	No. 240741
ERATAC mounting clamp	No. 240500
ERATAC Picatinny Mount Double Clamp	No. 240501

PumIR™ afocal Lens

The PumIR objective flap can be replaced with a 2x afocal lens can be attached. This increases the detection range up to 4000m. The PumIR detects the lens automatically and the collimation information of the lens is retrieved from memory. This means that the PumIR does not have to be re-zeroed after the afocal lens has been fitted. The automatic on/off function (see p. 4) also works with the flap of the afocal lens.

PumIR-M with afocal lens I Art. Nr. 240704

Combination with micro sights

A new feature of the PumIR is the top-platform for special accessory options. This enables the use of scopes with attached backup reflex sights. Alternatively, a micro sight e.g., the ACRO series from Aimpoint, can be mounted on top using the adapter plate (see p. 35).

PumIR-M with Aimpoint ACRO P2

Calibration

The PumIR shares the same three calibration options as all of our devices:
The simplest option is to use the built-in automatic shutter. It starts automatically after switching on, or opening the lens cap. If you are disturbed by the clicking noise, it can be deactivated. To do so, simply close the lens cap briefly. The device is calibrated manually. In addition, the process is virtually silent and can be repeated as often as desired. Additionally, a software shutter works in the background to continuously optimize the image without noise.

.5 variants

Why is the image in my device so bad? You have powerful optics and the best thermal imager in the world, yet when you combine the two, the image is pixelated and blurry? Then they are not properly matched. With the PumIR, we have a solution to this problem for the first time. Both the civilian and military versions are available with a reducing eyepiece optic. This allows the use of riflescopes that have a higher magnification than the recommended 2x magnification. Thus, even with 3-4x scopes, the entire image can still be seen. Please note that collimating the PumIR.5 to the rifle and test firing it, is mandatory (for more information see next page).
Technical data of the PumIR™ see page 17.

4x scope with conventional thermal imaging clip-on (36mm)

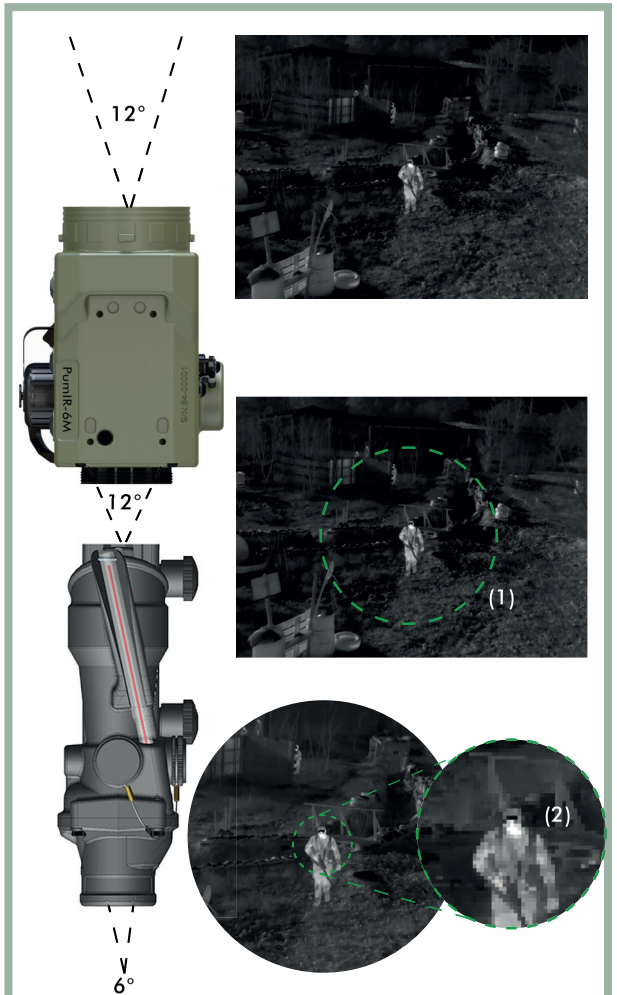
and PumIR-6M.5

Objective Microbolometer

PumIR eyepiece OLED

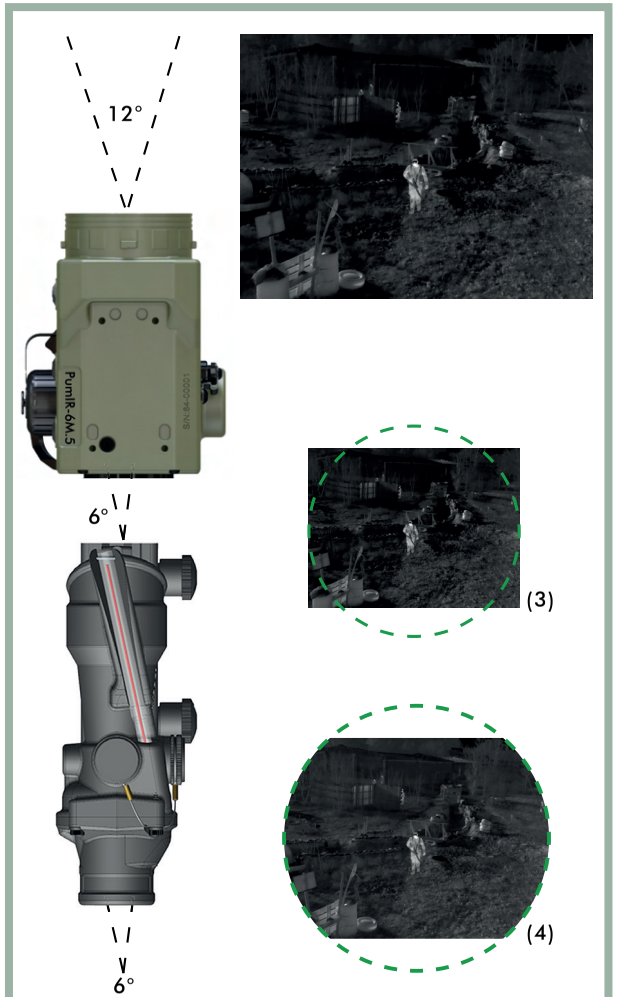
User Scope

PumIR-M™



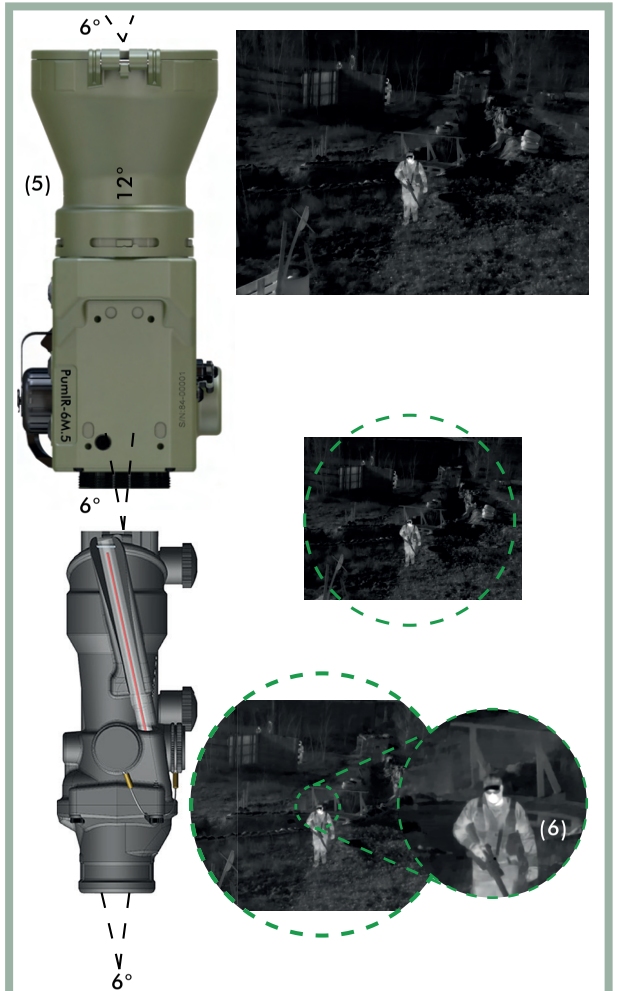
The PumIR-6M™ is similar in design to conventional thermal imaging clip-ons. It has 1x magnification and a range of 2km with its 12° field of view (horizontal). It works best with scopes that also have a 12° field of view. Such scopes usually have a magnification of about 2x. Then almost the entire thermal sensor image will be also dispalyed in the scope.
Advantage: Since the PumIR in this case has a 1:1 magnification, the reticle with its markings can be used directly for range estimation or correction of point of impact. Disadvantage: An ACOG with a 4x magnification usually has an angle of view of about 6°. This results in only a small part of the image being displayed in the center of the OLED (1). The high magnification then leads to disturbing pixelation of the image (2).

PumIR-M.5™



With the PumIR-6M.5™, the objective viewing angle is the same as with the 6M. So the range remains the same. But we have installed a special eyepiece, which only has a 6° viewing angle. This results in an overall reduction of the OLED image in the eyepiece (3). Advantage: The 6° viewing angle in the eyepiece now corresponds exactly to the 6° viewing angle that the 4x ACOG also has. Thus, the ACOG can see almost the entire OLED in the eyepiece (4). This results in a 100% increased overview and a 4x sharper image.
Disadvantage: Depending at a distance, the markings in a ballistic reticle are no longer correct at a simple digital magnification. To make the ballistic reticle markings correct again for greater distances, the PumIR must be operated in 2x digital zoom.

PumIR-M.5™ with afocal lens



Through the afocal magnification lens (5), the PumIR-6M.5™ achieves the same as before with the digital zoom, but here, of course, the image quality is 4x better, since it is an optical and not a digital magnification (6). With this combination, the full resolution of the sensor with its 640 pixels is visible in the ACOG.

Technical data PumIR™

		PumIR™			
Model		PumIR-Z20™	PumIR-Z20.5™	PumIR-M20™	PumIR-M20.5™
Order number		240712	240711	240714	240713
User group		civil user		authorities only	
Temperature resolution		<20mK			
Sensor resolution microbolometer		640×512 (60Hz)			
Zoom (digital)		1x, 2x,3x, 4x, 8x	0.5x, 1x,1.5x, 2x, 4x	1x, 2x, 3x, 4x, 8x	0.5x, 1x, 1.5x, 2x, 4x
Detection range	without afocal lens	2000m			
	with afocal lens	4000m			
min. Object distance for fixfocus		>40 m			
Focal length		36mm			
Spectrum / Pixel pitch		7.5–12.5µm / 12µ uncooled microbolometer			
FFC (Calibration modes)		internal mechanical shutter (can be switched off) + software calibration (NUC) + external calibration via front flap			
Sunlight sensitivity		no			
Filter modes		(Boost) White Hot, (Boost) Black Hot, (Boost) Red Hot, (Boost) Cold Red, (Boost) Cold Green, Rainbow, Rainbow HC, Iron Bow, Glowbow, Hottest, Outline			
Brightness control		8 Levels			
Video output		digital video output USB webcam			
Display		(Micro-)OLED 873×500 Pixel			
Eyepiece configuration suitable for riflescopes with		~2x magnification	~4x magnification	~2x magnification	~4x magnification
Eyepiece magnification		1x	0,5x	1x	0,5x
FOV field of view Eyepiece		horizontal 12° vertical 9.6	horizontal 6° vertical 4,8°	horizontal 12° vertical 9,6°	horizontal 6° vertical 4,8°
FOV field of view Objective (at 100m)		horizontal 12° (21m) vertical 9,6° (16,8m)			
Angular resolution horizontal		0.019°/1.13'/68" corresponds to 3,28cm/px (at 100m)			
Battery life CR123		up to 4h 30min			
Rechargeable battery life		18650 approx. 8h			
Temperature range		operating: - 32°C to +50 °C; storage: - 40°C to +80°C			
Waterproofness		IP68			
Impact resistance		MIL-STD-810G (CHG 1) 516.6 Shock: Procedure IV – Transit Drop (26 drops from 1.22m)			
Conformities		MIL-STD-810H 501.7 High Temperature: Procedure 1 & Procedure 2 MIL-STD-810H 502.7 LowTemperature: Procedure 1 & Procedure 2 MIL-STD-810H 503.7 Procedure 1-D Temperature Shock MIL-STD-810H (CHG 1) 506.6 Rain: Procedure 1 & Procedure 2 & Procedure 3 MIL-STD-810H (CHG 1) 510.7 Sand and Dust: Procedure 1 & Procedure 2 MIL-STD-810G (CHG 1) 516.6 Shock: Procedure 1 & Procedure IV MIL-STD-810H (CHG 1) 519.8 Gunfire Shock: Procedure 2 – Kaliber7, 62x51 mm NATO (3600J), Firing sequence 250x40 @ 650-800/min mounted onto Picatinny rail			
Material		Aerospace aluminum with ceramic coating (Magpul foliage green)			
Dimensions (without accessories)		L:104mm; W:80mm; H: 56mm			
Weight (without accessories/battery)		approx. 300g			
Connection possibilities		Eyepiece: M35x1; Bottom: 8x M3-4 for elevation adjustment and Picatinny mounting, 20 UNC tripod thread			
Accessories (optional)		afocal lens, obervation eyepiece, video and power cables, tripod rail for QD mounts (e.g. ERATAC) according to STANAG 4694 and MIL-STD-1913/STANAG 2324, top mount rail			

TigIR™ series

The shortest thermal imaging device with 3km range

The TigIR is currently the lightest and shortest thermal imaging device with 55mm optics. No other device with a total length of only 111mm reaches a range (standing person) up to 3000m. These small dimensions could only be achieved by developing a special folded eyepiece optic. This makes it possible to use the TigIR in front of different scopes (3-6x) without loss of quality.
The housing surface is hard anodized and coated with Cerakote. The refore, the TigIR can withstand even hard impacts in a harsh environment. Although it weighs only about 500g, it lighter than any other comparable device.

High performance thermal imaging sensor with 640x512 pixels, <20mK thermal sensitivity and 55mm f/1.0 lens with <20mK thermal sensitivity. Like all our thermal imaging systems, the TigIR is only available with 60Hz sensors

Waterproof case made of hard anodized, ceramic coated aerospace aluminum filled with nitrogen

ERATAC mount with safety lock and the ability to adapt to various Picatinny rails (TigIR-6M).

Waterproof interface connector for:
- analog video output PAL/ NTSC
- external power supply
- remote control

4 waterproof rubber buttons to control the thermal imaging functions

TigIR-6M

Optics

Since the entire housing is made of very robust aluminum and the lens is athermal, the TigIR reaches excellent precision even under extreme temperature conditions. This also ensures that the hit accuracy remains the same regardless of weather or daytime.

New: Thermal resolution

The TigIR has a particularly high thermal resolution of <20mK. This means that not only heat sources are visible over long distances - Equipment, clothing and hidden objects can also be detected very clear.

TigIR™ features

Integrated lens cover with the following functions:
- device on/off
- manual calibration
- protection objective lens

The waterproof battery compartment for four CR123 batteries or two rechargeable batteries (16650) allows a runtime of up to ten hours

Eyepiece optics for cameras and scopes with 3-6x magnification

Adaptable to different axis heights of scopes by means of tripod rails

The civil version of the TigIR has a thread (M52x0.75) for mounting clip-on adapters directly (see page 7)

TigIR-6Z+™ – The Civil Version

With 640x512 pixels and a focal length of 55mm, the TigIR-6Z+ is currently the most powerful thermal clip on in the civilian sector. Since the TigIR-6Z+ interfaces with adapters from various manufacturers, the device can be mounted directly in front of various optics. Compared to other thermal imagers, the leverage on the optics is low due to its light weight and extremely short length of only 11cm. That significantly improves the precision of the TigiR.

TigIR™ compatibility and adapters

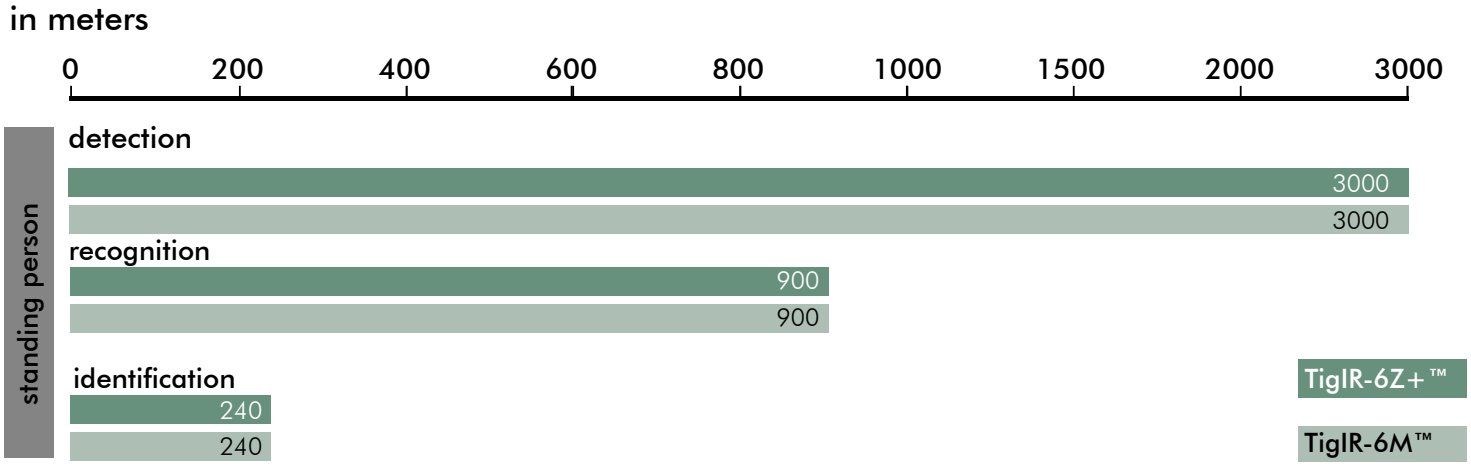
For almost every objective diameter (30mm - 80mm) there is a suitable adapter for the TigIR-6Z+. The adapter is simply screwed onto the thread of the eyepiece side and locked there. The other side of the adapter is e. g. pushed onto a spotting scope, and secured by a lever. After mounting, collimation is possible, but not mandatory, since the TigIR is already pre-collimated at the factory.
The even better „Präzise Jagen“ adapters are also compatible and the selection for different lens diameters is constantly being expanded. Please check page 7 for all the available models.

Hunting with the TigIR-6Z+

The civilian version, the TigIR-6Z+, is especially popular with hunters. Thanks to the AI upscaling technology, the TigIR shows an increased precision by 100% compared to conventional devices. Therefore precise hits are possible beyond 400m distance even at night.

TigIR-6Z+ with Rusan adapter mounted on spotting scope

Ranges of the TigIR™ models



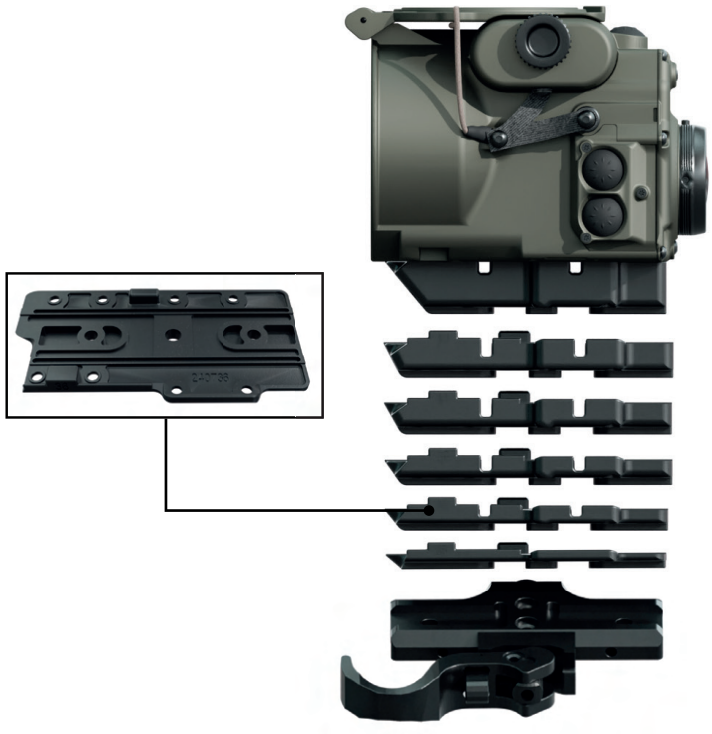
TigIR-6M™ – The Military Version

The TigIR-6M is currently the shortest thermal clip on with 55mm optics and is already in use by several NATO forces. The device is ideal for use in combination with 3-6x magnifying scopes. In addition, the rugged aluminum housing provides good protection against drops and ensures consistently high precision even in varying ambient temperatures. The TigIR-6M is sold to authorities only.

NSN: 5855-12-416-6304
NCAGE: CB068

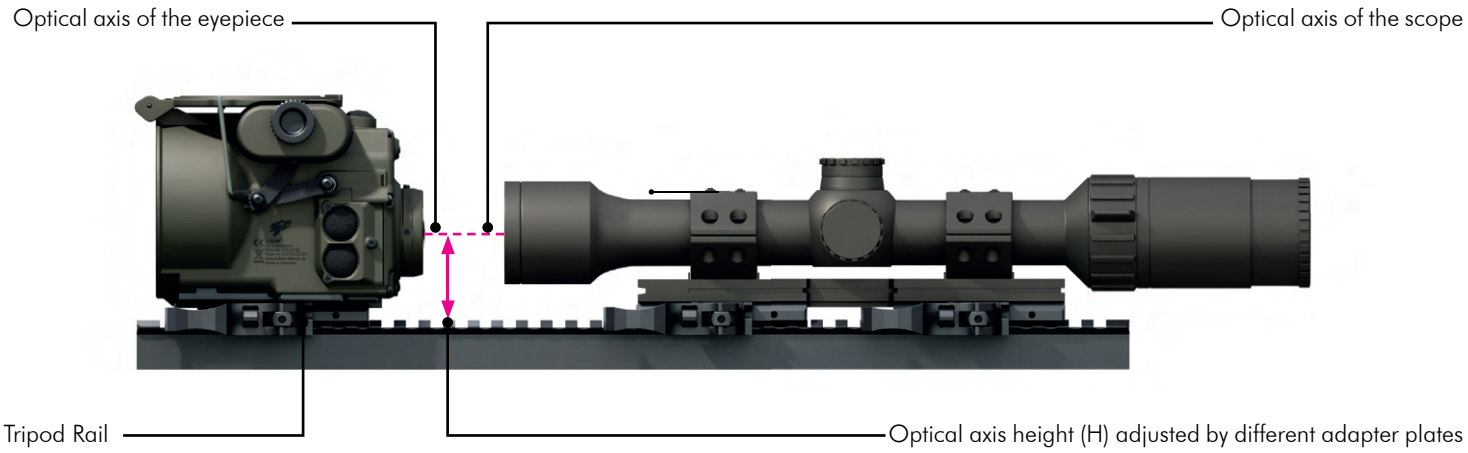
Tripod Rail

For mounting the TigIR-6M on STANAG rails, the use of a robust ERATAC mount is recommended. Various tripod rails are available for connection of the TigIR-6M, allowing height adjustment. Since the TigIR-6M is very flat, with heights varying between models it has an optical axis height (H) of only 36mm with the thinnest adapter plate. This height is measured from the top of the Picatinny rail to the optical axis of the eyepiece.



TigIR-6M with Tripod Rail and Picatinny clamp

Tripod Rail:	
H=36mm	No. 240405
H=38mm	No. 240408
H=39mm	No. 240406
H=42mm	No. 240410
H=48mm	No. 240407
H=51,3mm	No. 240409
ERATAC Picatinny clamp	No. 240500
ERATAC Picatinny Mount Double Clamp	No. 240501



Usability with machine guns

The extremely short design of the TigIR-6M allows mounting on machine guns where, due to the design, only limited space for attachments is available. Thus, in combination with certain scopes such as the ELCAN Specter (see p. 25), the device protrudes only 10cm above the optics.

With most machine guns, the belt feeder cover can be fully opened even with the TigIR-6M being mounted. The robust housing and the special optics withstand the strong forces up to calibre .50 BMG.

TigIR-6M mounted on machine gun

Technical data TigIR™

		TigIR™				
Model		TigIR-6Z+™	TigIR-Z20™	TigIR-Z15™	TigIR-6M™	TigIR-M20™
Order number		240401	240411	240413	240400	240412
NSN		-	-	-	5855-12-416-6304	-
User group		civil user			authorities only	
Temperature resolution		<40mk	<20mk	<15mk	<40mK	<20mk
Sensor resolution microbolometer		640×512 (60Hz)				
Outline mode		-	yes	yes	-	yes
Zoom (digital)		0.8x, 1x, 2x, 4x, 6x				
Detection range	without afocal lens	3000m				
	with afocal lens	-				
min. Object distance for fixfocus		> 50m				
Focal length		55mm				
Spectrum / Pixel pitch		7.5–12.5µm / 12µ uncooled microbolometer				
FFC (Calibration modes)		internal mechanical shutter (can be switched off) + software calibration (NUC) + external calibration via front flap				
Sunlight sensitivity		no				
Filter modes		(Boost) White Hot, (Boost) Black Hot, (Boost) Red Hot, (Boost) Cold Red, (Boost) Cold Green, Rainbow, Rainbow HC, Iron Bow, Glowbow, Hottest, Outline				
Brightness control		8 Levels				
Video output		analog video output PAL/NTSC				
Display		(Micro-)OLED 873×500 Pixel				
Eyepiece configuration suitable for riflescopes with		magnification between ~3x (best) and ~6x				
Eyepiece magnification		1x				
FOV field of view Eyepiece		horizontal 8° vertical 6°				
FOV field of view Objective (at 100m)		horizontal 8° (14m) vertical 6° (10,5m)				
Angular resolution horizontal		0.0125°/0.75'/45" corresponds to 2,18 cm/px (at 100m)				
Battery life CR123		up to 10h 30min				
Rechargeable battery life		16650 up to 8h				
Temperature range		operating: - 32°C to +50 °C; storage: - 40°C to +80°C				
Waterproofness		IP68				
Impact resistance		MIL-STD-810G (CHG 1) 516.7 Shock: Procedure IV – Transit Drop (26 drops from 1.22m)				
Conformities		MIL-STD-810G (CHG 1) 510.6 Sand and Dust: Procedure 1 & Procedure 2 MIL-STD-810G (CHG 1) 506.6 Rain: Procedure 1 & Procedure 2 & Procedure 3 MIL-STD-810G (CHG 1) 516.7 Shock: Procedure 1 & Procedure IV MIL-STD-810G (CHG 1) 519.7 Gunfire Shock: Procedure 2 – Kaliber7, 62x51 mm NATO (3600J), Firing sequence 250x40 @ 650-800/min mounted onto Picatinny rail MIL-STD-810H 501.7 High Temperature: Procedure 1 & Procedure 2 MIL-STD-810H 502.7 LowTemperature: Procedure 1 & Procedure 2 MIL-STD-810H 503.7 Procedure 1-D Temperature Shock				
Material		Aerospace aluminum with ceramic coating (Magpul foliage green)				
Dimensions (without accessories)		L: 112mm; W: 82mm; H: 80mm				
Weight (without accessories/battery)		approx. 527g				
Connection possibilities		Eyepiece: M52x0.75				
Accessories (optional)		observation eyepiece, video and power cables, tripod rail for QD mounts (e.g. ERATAC) according to STANAG 4694 and MIL-STD-1913/STANAG 2324				

TILO™ series

The smallest thermal goggles in the world

The TILO stands for „Thermal Imaging Light Optic“ and was developed as a thermal imaging goggle. With 4-6cm length and 100g-150g weight, it is the smallest and lightest thermal imaging goggle in the world. It can be worn on helmets as well as caps and headbands. Currently, there is no comparable device with such high technical performance in such a small design. The performance is comparable to larger hand-held systems. The TILO-6, for example, features a thermal sensor with a high resolution of 640x512 pixels. In addition, all devices in the series are equipped with high-power LEDs. New TILO models have a thermal resolution of at least 20mK. Thus, temperature differences of less than 0.02°C can be displayed, which can be very helpful in bad weather conditions or indoors.

Illustration similar

New: TILO™ Cap

The Cap Holder system provides another device for using the TILO™ as thermal goggles. Lighter than a bump helmet and more stable than the headband. A welcome alternative to the previous platforms, which is particularly suitable for use in the civilian sector - for hunting, for example.

The Cap Holder works according to the same principle as all standard helmet adapters from Andres Defence. The newly designed mounting system is installed directly in the particularly flat peak of the cap, which ensures increased stability. The TILO™ - Cap is only available as a pre-assembled set. Adjustable in size and compatible with all TILO models.

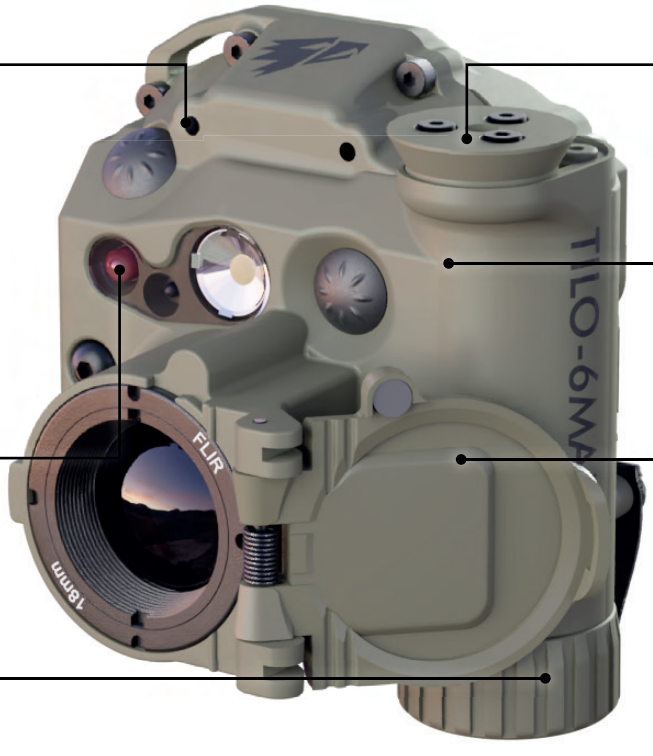
TILO™ features

Safety eyelet for hand strap

Waterproof rubber buttons for thermal and lamp functions

External power supply and Video output (NTSC/PAL)

High performance thermal image sensor with high thermal resolution up to 20mK (TILO series Z+ and M)



Connection thread for external accessories such as tripod adapters (see p. 36)

Mounting plate for helmet adapter

Waterproof impact resistant housing

LED:
- White (160 lumens)
- Red (24 lumens)
- IR (15 lumens, reliable invisible 940 nm)

Lens flap with 4 functions:
- Protection
- Switch on
- Switch off
- Manual calibration

Waterproof compartment for CR123 battery or 16650 rechargeable battery

Thermal mode

The TILO starts automatically by opening the flap.The high thermal resolution enables orientation even indoors or under poor weather conditions. The large field of view of 24° for thermal imaging devices also helps in this respect. This makes it ideal for use by hunters for stalking and tracking or by authorities for observation and reconnaissance.

Front and Side view of the TILO-3M mounted on a helmet

Headlamp mode

If the TILO is used only in headlamp mode, the energy consumption is merely dependent on the brightness setting. For this purpose, the three high-power LEDs (white, red, IR) can be selected from 5 different brightness levels. The thermal function can also be used simultaneously with the headlamp mode. Only the LED boost mode is excluded from this.

Eyepiece optics

With conventional linear optics, the TILO would not be the shortest thermal imaging goggles in the world. Therefore, a specially folded eyepiece optics was developed for the devices, which is also very tolerant in regard to the eye position. Thus, both eye distance and eye position are tolerated over a wide range. This is an important prerequisite for the use as thermal imaging goggles on a tactical helmet. In addition, the maximum possible eye relief of 25mm means that safety glasses can be worn comfortably between the eye and the TILO.

TILO-3™ series
320×256 pixel sensor resolution

The TILO-3 is currently the smallest of the small. With a CR123 battery, it achieves an impressive runtime of over three hours. With a 16650 rechargeable battery even up to six hours. The simple Z-version has a lower thermal resolution, but is particularly inexpensive and therefore very popular.

TILO-3Z+2×™
Double optical magnification

A TILO-3Z+ with a more powerful lens that makes it more usable for reconnaissance and observation. Due to the stronger magnification, it has a longer range of 1000 meters. This makes it an affordable alternative to the powerful TILO-6, but the field of view is reduced to 12° due to the higher magnification. Thus, it is rather unsuitable for use as thermal imaging goggles.

TILO-6™ series
Highest sensor resolution

The TILO-6 devices have the highest pixel resolution (640x512) and a thermal resolution of 60mK for the Z devices and 40mK for the Z+ devices. It thus achieves a detection range of up to 1000 m with a viewing angle of 24°, which also enables good orientation indoors. The sensor performance is only surpassed by the new TILO-20mK devices (see below).

TILO-20mk™

The TILO-20 series is equipped with the new thermal sensor from FLIR, which has a resolution of 20mK. This offers considerable advantages, especially when used indoors and in bad weather, so that the detection range increases. The following aluminum TILO models are available with a 20mK sensor: TILO-M20, TILO-Z20.

TILO Afocal Lens Increases the range of the TILO™ devices up to 2000m

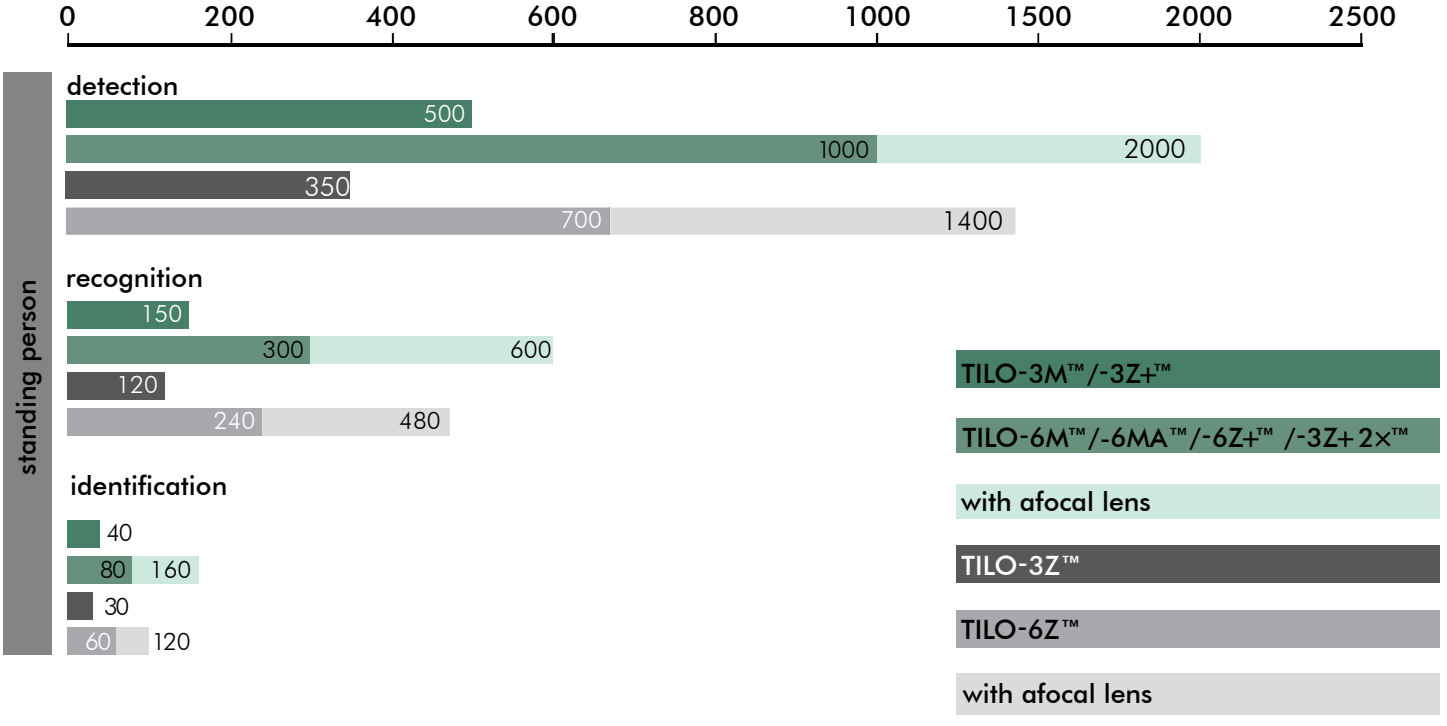
With the 2.5x afocal lens, the range of application of the TILO-6 can be considerably extended. It is thus possible to upgrade the world's smallest thermal imaging goggles to a medium-range observation device. Unlike conventional afocal lenses, the thermal resolution deteriorates only slightly despite high magnification. The afocal lens covers the entire lens surface of the TILO™, therefore there is almost no light loss (thermal radiation loss). Using the buttons, the afocal lens can be calibrated within seconds and vignetting is maximally reduced or even prevented. The afocal lens comes with a convenient bayonet mount. This allows the lens to be attached and detached quickly. However, this accessory is limited only to the TILO-6 series and the TILO-3Z+2x. (see p. 28).

TILO-6MA with adapter for the afocal lens

TILO-6MA with afocal lens I Art. Nr. 382017

Range comparison of the TILO™ models

in meters



TILO-M20/6MA™ – The Military Versions

The TILO-M series is available for authorities only. It is equipped with a bayonet adapter on the eyepiece side. On the one hand, this serves to securely attach the shutter eyecup (see p.36), and on the other hand, to attach the TILO to a wide variety of target optics. In this way, the TILO-6M/6MA can be mounted with repeatable accuracy, e.g. on an ELCAN Specter 1x/4x.

NCAGE: CB068

NSN: 5855-12-416-6303

TILO-6MA™

TILO-3M™

TILO-M20™

Use as thermal clip-on

All TILO-M versions can be used as thermal clip-ons. However, for better repeatability, we recommend the TILO-6MA due to its mounting being integral part of the housing. Several adapters for different target optics are already available. However, it should be noted that the result is best with an optic that has a magnification of 1x.

TILO-6MA as thermal clip-on mounted on a 30mm scope with camera adapter (see p. 40)

Bayonet adapter for attaching shutter eye cup (see p. 40) or attachment adapter

ELCAN adapter

With the ELCAN Adapter, the TILO is the only thermal clip-on that can be attached directly to an ELCAN Specter 1x/4x. Our latest generation enables a more simplified attachment and comes with a improved locking mechanism. For the ELCAN adapter we recommend using the TILO-6MA, as it is made entierely of metal and therefore ensures greater precision and a more durable repetition rate.

TILO ELCAN adapter I Art. Nr. 382035

TILO-M20, ELCAN adapter and ELCAN mounted

TILO-6MA, ELCAN adapter and ELCAN in exploded view

We are pleased to offer you the ELCAN Specter in its different versions in our webshop
www.andres-industries.de

Caliber Options: 5.56mm, 7.62mm
Colors: Hard-anodized aluminium, Flat Dark Earth

TILO-6MA/M20™

The TILO-6MA is the particularly robust military version of the series. The housing was developed for the special requirements of naval units and is therefore completely milled from corrosion-resistant aluminum. For this reason, the TILO-6MA offers the following additional features:

- waterproof up to 10m (tested 20m)
- integrated bayonet adapter for better precision as a clip-on
- increased impact resistance
- corrosion resistant housing
- New: TILO-M20 now with 20mK thermal resolution

TILO-6MA

TILO-6MA attached to helmet

Red Dot Flipper

With the Red Dot Flipper (RDF), the TILO-6M(A) can be used in front of a reflex sight. It is attached to the RDF within seconds. In combination with a flip mount like SAMSON, the system can be flipped out of the field of view in less than a second. For optical reasons, the angle of view through the RDF is only 12°, which is about the same as the usual angle of view through the reflex sight. The RDF should be collimated with the TILO before use to achieve the highest possible precision.
We recommend a maximum magnification of 2x.

Red Dot Flipper I Art. Nr. 382019

Red Dot Flipper on a SAMSON flip-to-side mount

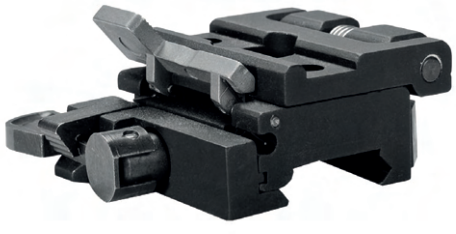
TILO-6MA flipped in front of a scope

Holosight reticle with thermal image

TILO-6MA with RDF in front of a red dot sight

Technical data

	Red Dot Flipper
Order number	382019
Weight	76g (without Flip-to-side-mount)
Dimensions (mm)	48x48x42
Color	black matte
Waterproofness	IP68
Magnification	0.5
protection class	MIL-STD-810G / IP68



Quick Release Base with Flip-to-side-mount I Art. Nr. 382021
SAMSON - patented side-folding mount technology for users who need a quick solution for optics and accessories.

Technical data

				
Model	**TILO-3Z+™**	**TILO-3Z™**	**TILO-3Z+2x™**	**TILO-6MA™**
Order number	380104	380103	380105	380109
NSN	-			5855-12-416-6303
User group	civil use			authority only
Sensor resolution	320x256 Pixel, 60Hz			
Temperature resolution	<40mK	<60mK		<40mK
Zoom (digital)	0,8x,1x, 2x, 4x, 8x		1,6x, 2x, 4x, 8x, 16x	
Optical magnification	1x		2x	
Spectrum/Pixel pitch	7.5 - 13.5			
Sunlight sensitivity				
Filters	(Boost) White Hot, (Boost) Black Rainbow, R			
Video output				
Field of view (FOV)	horizontal 24° / vertical 19°		horizontal 12° / vertical 9.5°	
Display				
Battery 1x CR123 — Light				
Battery 1x CR123 — thermal	approx. 3:15h			
2x CR123 (only thermal)	approx. 7:00h			
Rechargeable battery 16650 (only thermal)	approx. 6:00h			
Helmet mounting	Adapter for			
Headband	Adapte			
Light	white: (boost: 160 ANSI lumen) normal 45			
Flashing, SOS				
Brightness control				
Usage temperature	–30°C up to +60°C	–32°C up to +60°C		–30°C up to +60°C
Storage temperature				
Waterproof	IP68	IP65	IP68	IP68
Impact resistance	MIL-STD-810G 4.			
Material	Polyamide housing; eyepiece optics cover made of sapphire glass	Polyamide housing; surface-hardened PMMA eyepiece optics cover	Polyamide housing; surface-hardened PMMA eyepiece optics cover	Housing: aerospace aluminum; cover eyepiece optics made of sapphire glass
Dimensions (without accessories such as eyecups)	Length: 40mm; Width: 64mm; Height: 67mm		Length: 58mm; Width: 64mm; Height: 67mm	Length: 58mm; Width: 64mm; Height: 70mm
Weight (without accessories)	approx. 100g		approx. 128g	approx. 152g

			
TILO-6Z+™	TILO-Z15™	TILO-Z20™	TILO-M20™
380107	382042	382041	382040
-	-		
civil use			authority only
640x512 Pixel, 60Hz			
	<15mK	<20mK	
0,8x,1x, 2x, 4x, 8x			
1x			
5µm / 12µm uncooled microbolometer			
no			
Hot, (Boost) Red Hot, (Boost) Cold Red, (Boost) Cold Green, ainbow HC, Iron Bow, Glowbow, Hottest			
PAL/NTSC			
horizontal 24° / vertical 19°			
(Micro-)OLED 873×500 Pixel			
up to 24h			
approx. 1:45h			
approx. 4:00h			
approx. 3:15h			
ballistic helmets optional (see p. 36/37)			
er for headband optional (see p. 37)			
ANSI lumen, red (626nm): 24 ANSI lumen, IR (940nm): 15 ANSI lumen			
yes			
8 levels			
	−20°C up to +60°C	−30°C up to +60°C	
−40°C bis +80°C			
IP68	IP65	IP68	
6.5 Procedure IV - Transit Drop (military grade)			
Polyamide housing; eyepiece optics cover made of sapphire glass	Polyamide housing; surface-hardened PMMA eye-piece optics cover	Housing: aerospace aluminum; cover eyepiece optics made of sapphire glass	
Length: 58mm; Width: 64mm; Height: 67mm		Length: 58mm; Width: 64mm; Height: 70mm	
approx. 128g		approx. 152g	

Night vision devices

Sale to authorities and civil users

The best binocular night vision device on the market has many helpful features. For example, it switches off automatically when flipped up, which prevents telltale stray light. This even works with individual tubes when they are just folded to the side, for example to aim a gun. Of course, there are also many accessory options for this device (see p. 38) such as the locking system, which keeps the interpupillary distance absolutely constant after folding it down.

The purchase of night vision equipment requires a special relationship of trust. Often the performance of night vision devices is difficult to describe in numbers. That is why we always specify a minimum FOM score of the devices we sell, which we exceed without exception. Of course, we also offer all clients the opportunity to take part in our training events free of charge and subsequently test the performance of devices before purchasing them from us. Once a selection has been made, the desired device is custom-made exactly according to these customer requirements.
This can take from two to 25 weeks depending on the choice of tubes.

1 | MINI-14 (aka MUM-14 / NT940)

The MINI-14 is one of the lightest 18mm monoculars on the market. Although it is waterproof up to 20m, meeting the highest military requirements, it is ITAR-free. It has a wide range of accessories, making it extensively expandable. For example, with the bino bridge (see p. 39), two units can be used as one system. It is also possible to connect one with the weapon mount (see p. 38) and use it as a clip-on.

2 | PVS-14

ACT's PVS-14 is completely ITAR-free and without any shipping restrictions. This night vision device is a monocular and has been used by the US military for decades. The single tube technology makes it very user friendly to use. The automatic shut-off function when the night vision device is mounted on the helmet and flipped up makes it perfectly suited for professional use in urban environments. Thanks to the rugged housing, the PVS-14 is extremely durable. There is a wide range of accessories available on the civilian market, from rail mounts to magnifying lenses. Thus, the PVS-14 can be adapted to almost any requirement.

3 | DTNVS

The new DTNVS from ACT is currently the most powerful binocular night vision device. Due to its carbon housing t is extremely lightweight and offers many options for individual configuration. For example, it is available with affordable ECHO tubes, which are sufficient for private use. For professional users, however, we recommend the ECHO+ tubes, which are also inexpensive. For special units and other users who need highest performance, we offer a configuration with up to 2600 FOM.
Likewise, the eyepieces can be tailored to the user's needs. In addition to the normal eyepiece, there is also a particularly lightweight one (LWT40), as well as one with a particularly large eyebox (LWT40D), which offers significantly improved ergonomics.

4 | THE 14

THE14 Monocular combines lightweight materials to create the lightest PVS-14 type compatible monocular at 9 oz / 255g while still using standard 18mm image intensifier tubes. At no compromises in functionality it features manual gain, automatic flip up shut-off, IR illuminator, low battery indicator highlight cut-off while still utilize the same control pattern.
Furthermore, THE14 has a 66ft / 20m for 2h submersion rating which is tested for every single housing to ensure quality.
The monocular can be mounted to combat helmets or weapons, which enables night vision capabilities to daytime optical sights.

Tubes

The night vision devices can be equipped with different tubes. However, for such high-quality devices, it makes sense to use particularly powerful tubes. For authority customers, tubes with 1600 FOM and autogating are the minimum standard today. The most powerful tubes in Europe are currently Gen3 tubes with an FOM of up to 2600. These are available with the usual green phosphor, but also with white phosphor, which results in less fatigue and increased perceptual sharpness.

	Residual light amplifiers and night vision devices				
Tubes, FOM, equipment	MINI-14	PVS-14	DTNVS-14	DTNVS-14-LWT40	DTNVS-14-LWT40D
Photonis Echo 1600 Autogated EGC	Request	120084	Request	Request	Request
Photonis Echo 1600 Autogated EGC White Phosphor	Request	120085	Request	Request	Request
Photonis Echo 1600 Autogated	120124	Request	120503	120521	120539
Photonis Echo 1600 Autogated White Phosphor	120125	Request	120504	120522	120540
Photonis 4G 1800 Autogated	120109	120097	120509	120528	120545
Photonis 4G 1800 Autogated White Phosphor	120110	120098	120511	120529	120546
Harder Gen3 Alpha 1800 FOM Autogated White Phosphor	Request	120086	Request	Request	Request
Photonis Echo+ 2000 Autogated EGC	Request	120092	Request	Request	Request
Photonis Echo+ 2000 Autogated EGC White Phosphor	Request	120093	Request	Request	Request
Photonis Echo+ 2000 Autogated	120121	Request	120505	120523	120542
Photonis Echo+ 2000 Autogated White Phosphor	120122	Request	120506	120524	120541
Photonis 4G 2000 Autogated	120115	Request	120513	120530	120548
Photonis 4G 2000 Autogated White Phosphor	120116	120091	120512	120531	120547
Harder Gen3 2100 FOM Autogated	120104	120157	120507	120525	120543
Harder Gen3 2100 FOM Autogated White Phosphor	120105	120158	120508	120526	120544
Photonis 4G 2100 Autogated White Phosphor	Request	Request	120514	120532	120549
Harder Gen3 2200 FOM Autogated White Phosphor	Request	Request	120510	120527	Request
Photonis 4G 2200 Autogated White Phosphor	Request	120083	120517	120534	120550
Photonis 4G 2300 Autogated White Phosphor	Request	120082	120518	120536	120553
Harder Gen3 2400 FOM Autogated	Request	120090	120515	120533	120551
Harder Gen3 2400 FOM Autogated White Phosphor	Request	120089	120516	120535	120500
Harder Gen3 2600 FOM Autogated	Request	120088	120519	120537	120554
Harder Gen3 2600 FOM Autogated White Phosphor	120123	120087	120520	120538	120555

Technical data

	Image intensifiers and night vision devices					
Model	MINI-14	PVS-14	DTNVS-14	DTNVS-14-LWT40	DTNVS-14-LWT40D	THE 14
Order number	depending on the tube					
Surface	black matte, fiber reinforced plastic					
Dimensions (mm)	107.5×68.5×49.5	110×51×55	111×105×76			103×61×64
Weight	260g	350g	441-510g			
Power supply	CR123 lithium cell or one AA battery	CR123 lithium cell				1x AA
Operating time	approx. 40h		approx. 25h			approx . 40h
Waterproofness	2h	0,5h	up to 20m for 2h			
Warranty	1 year manufacturer warranty					
Binocular bridge	optional	–				
Data sheet	Original from manufacturer with serial number					
Magnification	1×					1x
FOM	1400 -2600, depending on the tube					
lp/mm	57–72					
Field of view	40°					
Lens aperture	F/1.2					
Diopters	+6 up to –4	+2 up to –6			+2 up to –2	+2 up to –6
Focus	15cm up to ∞	25cm up to ∞				
Accessories	Weapon mount, head mount, j-arm, eyecup (US standard), carrying case, shoulder strap, cleaning cloth, daylight filter, lens cap, sacrificial filter, manual, battery, battery adapter, afocal lens	Eyecup (US standard), carrying case, shoulder strap, cleaning cloth, daylight filter, lens cap, sacrificial filter, manual, battery, close-up lens, head mount, j-arm	Eyecups, carrying case, carrying bag, cleaning cloth, daylight caps, lens caps, sacrificial filter, manual, afocal lens			

Accessories

PumIR
TigIR
TILO

PumIR
TigIR
TILO

Video cable I Art. Nr. (TILO) 380223 I (TigIR) 240431 (PumIR) 240720
After connecting to the device the video signal can be output via the cinch connector. Compatible with all common PAL/NTSC compatible systems.

Power cable I Art. Nr. (TILO) 380210 I (TigIR) 240430 (PumIR) 240721

Video/Power cable I Art. Nr. (TILO) 380216 I (TigIR) 240432 (PumIR) 240722
Extrene power supply possible (USB).

Rechargeable Battery 16650 I Art. Nr. 382015
Suitable for TILO and TigIR series.
2500mAh (Li-Ion battery protected). Height: 68.0mm I Diameter: 16.7mm

Rechargeable Battery 18650 I Art. Nr.
Suitable for PumIR™.
2200mAh (Li-Ion battery protected). Height: 65.0mm I Diameter: 18.0mm

Lithium CR123 Battery I Art. Nr. 270025
Suitable for TILO, TigIR and PumIR series.
1550mAh Height: 34.5mm I Diameter: 17.0mm

PumIR
TigIR

Magnifier eyepiece 2.5x I Art. Nr. 250250
Although the civilian versions of TigIR and PumIR were developed as clip-ons for cameras and spotting scopes, they can also be used as handheld instruments with the lightweight magnifier eyepiece. With the digital zoom, different levels of magnifications can be achieved. Due to AI image processing, the image rarely “pixels” even at high digital magnification.

PumIR
TigIR
TILO

Battery Charger I Art. Nr. 382016
- Charging current 0.5A (500mA) or 1A (1000mA)
- Charging mode CC-CV (constant current, constant voltage)
- Compatible with all USB ports up to 5V 2100mA output
- High safety due to electronic protection: overvoltage, overcharge, short circuit and reverse polarity protection
- Display of charging voltage and battery status in percent

PumIR
TigIR
TILO

Video Grabber I Art. Nr. 382025
Recording device to capture the thermal image for further processing or to display it simultaneously on the integrated screen.

PumIR

Adapter plate ACRO I Art. Nr. 240705
Adapter plate for mounting an Aimpoint ACRO on the PumIR (see p. 10).

PumIR

TILO

Eyecup

Shutter Eyecup TILO

Eyecup I Art. Nr. 240061
Standard eyecup for protection against stray light.

Shutter Eyecup TILO I Art. Nr. 240070
Suitable for the TILO series. The shutter eyecup opens by pressure against the rubber rim.

TILO

TILO Cap I Art. Nr. 380227
The Cap Holder System is another way to use the TILO™ as thermal goggles. Lighter than a bump helmet and more stable than the headband, it is a welcome alternative to the previous platforms and is ideal for the civilian sector - e.g. for hunting.

TILO

TILO Shroud Mount I Art. Nr. 380219
For attaching the TILO directly to the helmet or other soft caps. The TILO is worn in front of the right eye.

TILO

Tripod mount I Art. Nr. 382013
The TILO can be mounted on a standard tripod using the tripod adapter. In this case, it is mounted upside down. The video recording function is sideways in this orientation, so it is not upside down.

TILO

Extension piece for Helmet Mount I Art. Nr. 382018
The extension arm for the helmet adapter can be used to additionally increase the distance between the TILO and the eye.

TILO

TILO Spacer for Helmet Mount I Art. Nr. 382022
With the spacer it is possible to attach the TILO to bump helmets and other helmets with thinner shells.

TILO

TILO Camera Adapter
30mm I Art. Nr. 380213
34mm I Art. Nr. 380228
40mm I Art. Nr. 380214

TILO

TILO Headband incl. adapter I Art. Nr. (TILO) 380202
Suitable for ballistic helmets. The cover remains free to attach other NVDs. Suitable for all TILO models.
By operating the release lever, the TILO can be removed within one second. Included are spacers for non-ballistic helmets and for a larger distance to the eye.

(see p. 26)

TILO

TILO Standard Helmet Mount I Art. Nr. (TILO) 380203

Suitable for ballistic helmets. The Shroud remains free to attach other NVDs. Suitable for all TILO models. By pressing the release lever, the TILO can be removed within one second. Incl. spacer for non-ballistic (shock) helmets and extension piece for for a larger distance to the eye.

MINI-14

DTNVS

Cadex Low Profile Mount I Art. Nr. (DTNVS) 120402 (MINI-14) 120403

The Cadex helmet mount has a very low profile, is ITAR-free, lightweight and very stable. Thus, the NVG can be folded out of sight in a second and locks in the raised state. Additional fastening as with conventional systems is therefore no longer necessary. It can be adjusted precisely and in all directions to the user's needs without tools.

TILO

Battery Extension I Art. Nr. (TILO) 382014 (TILO-MA) 382028

If this is screwed onto the TILO instead of the normal battery cap, either two normal batteries or an extended battery, e.g. TILO Rechargeable Battery, can be used. This way, the operating time of the TILO can be more than doubled to 6-7h.

TILO

Pouch MOLLE I Art. Nr. (Black) 380209 I (Olive) 380212 (Coyote) 380211

The modular TILO Pouch MOLLE is a small padded pouch for cameras and GPS devices. It can be attached to the belt and MOLLE systems. It offers space for a TILO incl. accessories such as headband and eyecup. The padding can be removed if necessary.

MINI-14

Weapon Mount I Art. Nr. 120410

The MINI-14 can also be mounted on firearms. It is best mounted behind a red dot sight so that the interpupillary distance to the eyepiece optics is as small as possible. Equipped with high-resolution tubes, it can even be mounted in front of a riflescope (up to 4x).

MINI-14

Sacrifical Lens I Art. Nr. (MINI-14) 120407 I Art. Nr. (DTNVS) 120405 I Art. Nr. (PVS-14) 120412

Protects the NVG lens against dust and other damage.

MINI-14

Training filter for MINI-14 I Art. Nr. 120406

The training filter for the MINI-14 reduces the incidence of light by 99% and thus enables training in daylight.

TILO

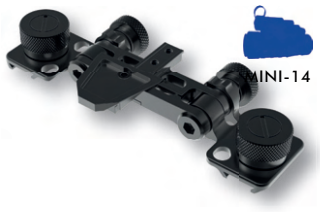
TILO-Rusan adapter I Art. Nr. 382023

The TILO-Rusan adapter allows you to connect the Rusan Adapter to the TILO. With the Rusan adapter you are able to connect a TILO e.g. with spotting scopes.

MINI-14

J-Arm suitable for MINI-14 I Art. Nr. 120409

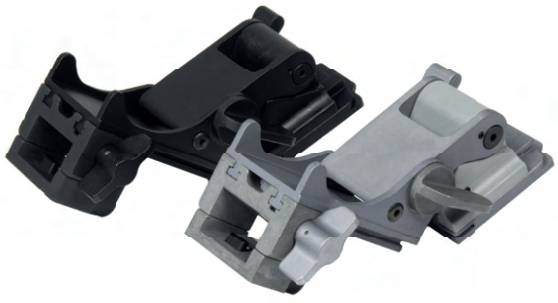
The MINI-14 J-Arm with NVG Interface Shoe provides a permanent connection for mounting a MINI-14 to a Norotos Helmet Interface Mount. It can be easily attached and detached from the MINI-14 using a thumbscrew. The user can select the height and angle for comfort and make fine adjustments to the arm to adjust the position of the night vision device for proper eye position.



MINI-14

Binobridge I Art. Nr. 371001

Different binobridges are available to combine two monoculars into one stereoscopic view. Please contact our sales team to find a perfect solution for your needs.



MINI-14

DTNVS

PVS-14

Norotos RHNO II Helmet Mount I Art. Nr. (Black) 230256
(Titan) 230257

The Norotos RHNO II Helmet Mount is the standard articulated NVG helmet mount for the MINI-14 and PVS-14. This mount promotes natural alignment of the head and neck, reducing muscle strain and fatigue.

MINI-14

DTNVS

PVS-14

Magnifying Lens I Art. Nr. (3x) 120400 I (5x) 120401

The observation range is increased with the magnifying lens. A little of the amplifier power is always lost, the image becomes darker, or the noise increases. Therefore, the use of high power tubes is particularly helpful here. Please specify your night vision device or contact our sales team to find a perfect solution for your needs.

MINI-14

DTNVS

PVS-14

Raptor Skull Crusher I Art. Nr. (Multicam) 371007
(Ranger Green) 371006

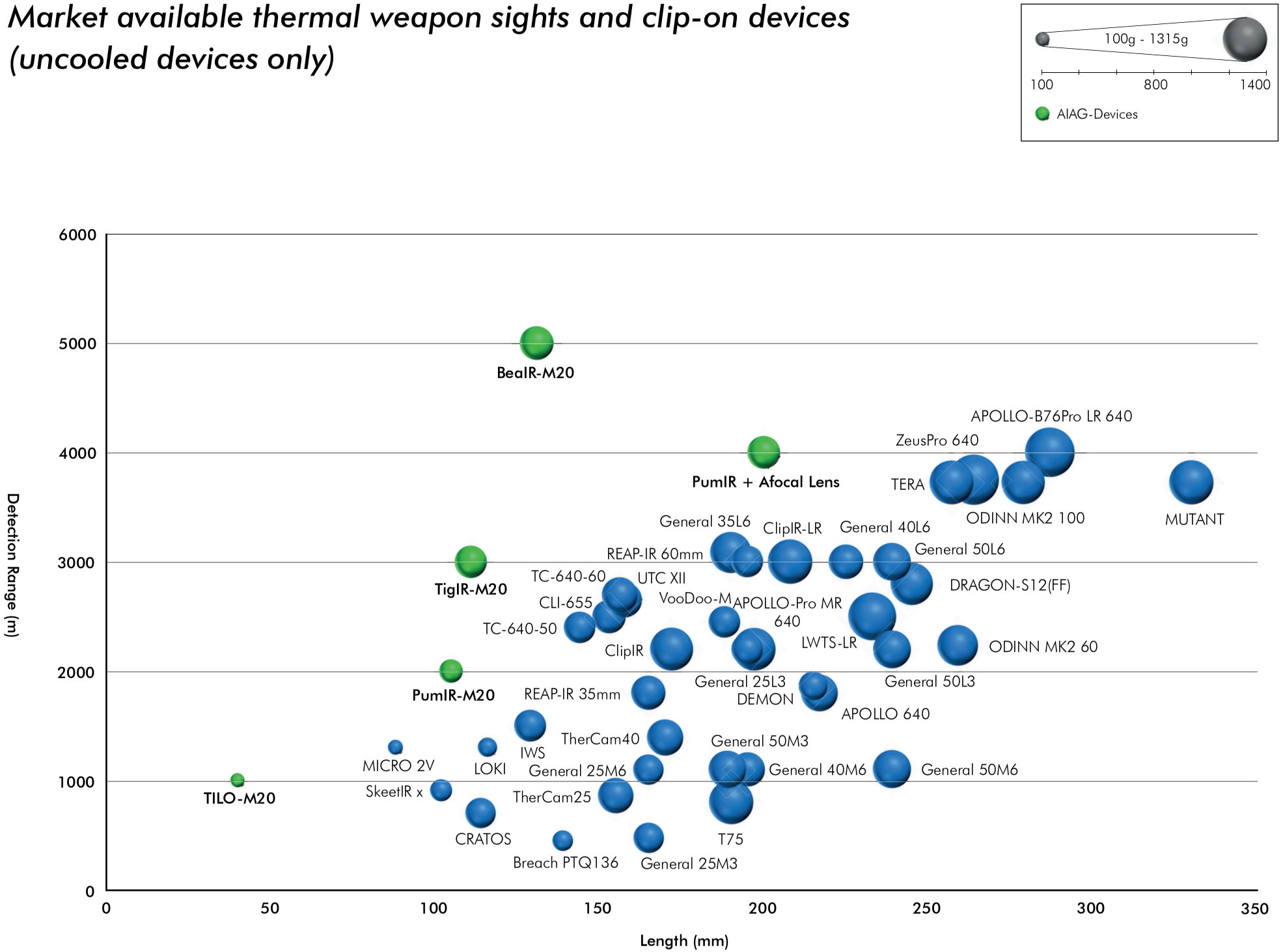
The world's most comfortable carrier for night vision devices. The Skull Crusher with Universal Shroud is made of a hybrid composite nylon and mesh fabric. It features an ultra-lightweight, rugged platform used to attach helmet accessories in environments where ballistic and impact protection is not required.

DTNVS

DTNVS IPD Locking System I Art. Nr. 120502

IPD=Interpupillary Distance. With this accessory, you can define the perfect distance of the eyepieces once and then always refer back to it (see p. 32).
Compatible with all DTNVS housings.

Market available thermal weapon sights and clip-on devices (uncooled devices only)



Your distributor

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