

# Matching infrared lenses to applications

Telephoto, wide angle, and macro



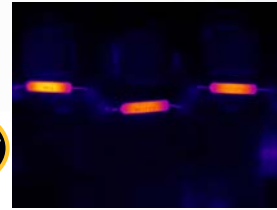
Standard



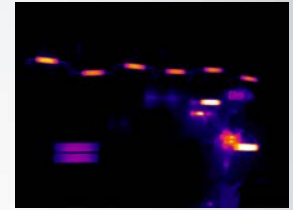
2x telephoto



4x telephoto



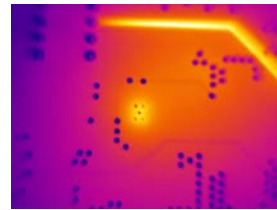
Standard (IR window)



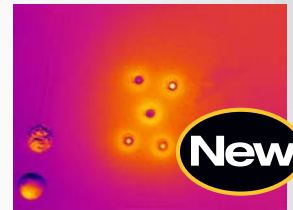
Wide angle (IR window)

## Key features

- See the right level of detail in your target from up close to very far
- Smart lenses that do not require calibration to a specific camera\*
- Interchangeable between compatible cameras\*
- Germanium with an engineered coating, the most efficient available material to transmit energy to the detector
- Specifically designed to work with your Fluke camera



Standard (PCB)



25 micron macro (PCB)

Lenses to camera compatibility						
Lens type	TiX560/ TiX520	Ti400/ 300/200	Ti32/ 29/27	TiX1000/660/640	Use for	Target audience
2x telephoto	TELE2	TELE2	TELE1	XLens/Tele	Small to medium sized target, viewed from a distance	<ul style="list-style-type: none"> <li>• Maintenance, electrical, and process technicians—when equipment is too high, difficult to reach, or unsafe to approach</li> <li>• Building inspection—see fine detail from a distance</li> </ul>
4x telephoto	4XTELE2	4XTELE2		XLens/SupTele	Small target, viewed from a great distance	Most relevant to those working in <ul style="list-style-type: none"> <li>• Petrochemical—tall stacks</li> <li>• Power utilities generation and transmission—long distances</li> <li>• Metallurgy and metals refinement—too hot to approach; may have equipment near refinery that needs inspection</li> </ul>
Wide angle	WIDE2	WIDE2	WIDE1	<ul style="list-style-type: none"> <li>• XLens/Wide</li> <li>• XLens/SupWide</li> </ul>	Large target, viewed from a relatively close distance	<ul style="list-style-type: none"> <li>• Maintenance, electrical, and process technicians—when working in a tight space or needing to view a large area</li> <li>• Building inspectors—for roofing and industrial building inspections, save time by seeing a much greater area at once</li> </ul>
Macro	25MAC2 25 micron			XLens/Macro1 81 micron (TiX1000) or 119 micron (TiX660/640) XLens/Macro2 32 micron (TiX1000) or 47 micron (TiX660/640) XLens/Macro3 35 micron (TiX1000) or 50 micron (TiX660/640)	Tiny to microscopic target, viewed from extremely close	Engineers and scientists working in <ul style="list-style-type: none"> <li>• Research and development</li> <li>• Electronics design and validation</li> <li>• Microscopic thermography</li> </ul> Audience can be found in universities and research organizations, process development, and micro-electronics design companies

\*Applies to lenses for TiX560, TiX520, Ti400, Ti300, and Ti200. Lenses for TiX1000, TiX660, and TiX640 require calibration. Lenses for Ti32, Ti29, and Ti27 have calibration files included with the lens, and the customer does not need to send the camera in for calibration

## Questions to ask

**Do you inspect targets that are distant and hard to get to, high, very large or very small, or even tiny to microscopic?**

A yes to any of these indicates a lens is needed. See the chart to determine the specific lens that is needed or continue to the questions below.

**For targets at a distance, how far will you be from the target? What size is the target? What is the smallest size of spot you need to measure?**

Go to the field of view calculator at [www.fluke.com/fov](http://www.fluke.com/fov) to determine which telephoto lens is needed.

**Do you inspect large buildings such as commercial facilities? Do you inspect buildings that are close together? Do you inspect roofs?**

With a wide angle lens, you can see a much larger area at once, which can save a lot of time in these applications.

**Do you need to see a large area in tight quarters? How far will you be able to get from the target? What is the target size that you need to view?**

Go to the field of view calculator at [www.fluke.com/fov](http://www.fluke.com/fov) to determine if the wide angle lens will meet their needs.

**Do you or someone else in your facility work with tiny to near microscopic size components such as micro-electronics?**

- The macro lens will likely be ideal.
- In a plant with maintenance staff and R&D engineers, a TiX560 or TiX520 can be shared between both teams, and the R&D team can keep the macro lens.

## Frequently asked questions

**The 4x lens is large; how do you keep it steady?**

It includes a patent-pending lens attachment system that holds the lens securely in place.

**How big is 25 microns?**

Smaller than the average human hair.

**How do you hold the TiX560/520 still enough when using the macro lens?**

- We recommend you use a bench-top mounting system with the tripod mount thread.
- Using remote control to capture images with the TiX560 can make it easier to ensure the camera remains motionless. (Remote control not available with TiX520)

**Why not use the Ti400 with the macro lens?**

The tripod mount accessory available for the Ti400 may not hold the camera still enough, so we don't recommend using the Ti400 with this lens.

**Why choose a TiX1000/660/640 plus macro lens over the TiX560/520 with the 25 micron macro lens?**

- The camera plus lens needs to be seen as a system. The TiX1000/660/640 offer features that aren't available in the TiX560/520, such as high speed imaging, improved thermal sensitivity, logging and trending, and greater customization. These features are often highly valued by the scientific and R&D user for their specific applications, where you may need to see extremely fast changes in temperature or very slight temperature differences, for example.
- The lenses for the TiX1000/660/640 offer greater flexibility to get a little further from the target and still see fine detail. The optimal working distance for the TiX560/520 macro lens is 10 mm from the target, so if there are any obstructions between the target and the camera, you may not be able to get close enough.

**What is the difference between the macro lenses for the TiX1000/660/640?**

- The macro 1 lens (81 or 119 microns) has a wider field of view so you can inspect a greater area at once, when this level of detail is sufficient. The working distance from the target is ~137 mm.
- The macro 2 lens (32 or 47 microns) gives you much finer detail with a smaller field of view, and you need to position the camera ~47 mm from the target.
- The macro 3 lens (35 or 50 microns) must be paired with a 2x telephoto lens. With this combination, you can see fine detail from a longer distance, which could be necessary when you cannot get close enough to the component due to probes or other obstructions. The working distance is ~100 mm from the target.

