



The Baumer TX camera family  
Versatility through innovation

# Digital cameras

## Versatility through innovation

One camera for every taste. Like a chef's signature dish, the right combination of ingredients makes the difference. Discover the excitement of the many "flavors" of the new TX camera family from Baumer.



# TX camera family

The digital cameras of the Baumer TX family stand for versatility through innovation and convince with their compact housing and their conformity to industrialized standards such as Gigabit Ethernet and FireWire™. State-of-the-art sensor technology combined with Baumer's own components and know-how guarantees perfect image quality from the sensor to the interface and further. Depending on your application, monochrome and color sensors with up to 5 megapixel are available.



Innovative developments such as industrial protection with dust proof and water proof IP67 housings or Gigabit Ethernet with fewer wires to manage using advanced Power over Gigabit Ethernet (PoE) technology are only two of the special features provided by the TX family.

Simple software integration of the TX camera family into your application is provided by the generic programming interface, called Baumer-GAPI, which was specifically developed for these cameras. Our Software Development Kit also contains all the necessary libraries, drivers and help files to integrate any Baumer camera easily into your individual user program. Of course, the cameras are supported by a variety of established standard image processing solutions, even without the Baumer-GAPI.

Consistent customer focus means more to us. We offer a convenient Starter Kit for Baumer Gigabit Ethernet cameras that allows you to quickly and easily test the camera in your application. Besides the desired camera, the package contains all necessary cables and components for an initial setup.



# Gigabit Ethernet

## Gigabit Ethernet enables completely new applications

In the TX camera family, the TXG series with GigE Vision™ uses the standardized Gigabit Ethernet interface for communication. This interface allows completely new applications of industrial imaging processing. Image data transfer of 1 Gbit/sec over cable lengths of 100 m breaks through all previous limits. In combination with switches, there are virtually no distance limits anymore. The increased networking capability allows a customized user solution to be scaled precisely to your requirements. Whether it is multi-camera operation, multi-computer operation or the integration of different network services – Baumer Gigabit Ethernet cameras permit innumerable network topologies.

The Baumer-GAPI is a generic program-



ming interface that ensures simple camera integration. As an alternative, any compatible image processing software may also be used. All camera functions are listed in a GenICam™ compliant XML file enabling the software to configure itself using the information contained in the file.

**GEN*<i>*CAM**

**GiGE™**  
VISION



## Power over Gigabit Ethernet

The economics or return on investment of industrial image processing systems are very sensitive to installation and maintenance costs. Consider that typical Gigabit Ethernet cameras need a separate cable for the power supply in addition to the data cable. Thanks to the new "Power over Gigabit Ethernet" (PoE) technology, Baumer can offer a single-cable solution for the TXG series where the data and power run on a single Ethernet cable. To simplify your procurement task we offer you the most advanced, specially developed network components.

## Baumer Starter Kit – just unwrap and go...

Evaluating a new camera should be as simple as snapping your fingers. With the Baumer Starter Kit we eliminate the time and frustration of searching for the right components to integrate the TXG camera into your application. Pick the camera of your choice, and Baumer provides you an all-in-one package for

effortless integration into your application, quickly and easily. Our software was developed for easy integration and is specially tailored to the requirements of TX cameras.



### The Starter Kit contains

- Baumer Gigabit Ethernet camera of your choice
- Baumer-GAPI SDK for Gigabit Ethernet, Windows
- Gigabit Ethernet PCI interface board
- Gigabit Ethernet cable 4.5 m
- Trigger and flash cable 5.0 m
- Power supply with 3.5 m cable
- Front mounting adapter, tripod mounting adapter

## Advanced industrial network components

To be most effective, industrial applications require specially designed network components. You want the right power supply and also simple installation on standard rails in control cabinets. To meet this requirement, we offer novel industrial network components such as switches and injectors. The multiport switches support all Gigabit Ethernet cameras as well as PoE cameras and supply the required voltage to each of them. Our dualport injectors allow you to provide operating voltage to two separate PoE cameras.



## Data transfer up to 800 Mbit/sec

Baumer offers the familiar FireWire™ interface with the TXD and TXF camera series. Unlike earlier cameras, these cameras support the newer IEEE1394b standard and will amaze you with 800 Mbit/sec data transfer rates. In addition, both series can still be used with the older IEEE1394a standard.

### TXD series – DCAM compliance simplifies integration

The TXD series uses the standardized DCAM (IIDC V1.31) protocol for data transmission. This protocol simplifies camera integration using the generic programming interface Baumer-GAPI or any other image processing software supporting this standard.



	Baumer FCAM	DCAM (IIDC)
Protocol type	Asynchronous	Isochronous
Bandwidth	100% (up to 80 MBytes/sec net)	80% (max. 64 MBytes/sec net)
Transfer reliability	Guaranteed lossless data exchange	No confirmation or error correction
Multi-camera operation	Dynamic bandwidth distribution	Manual bandwidth distribution
Interface	Baumer FCAM driver	DCAM (IIDC V1.31)
Image format change	"On the fly" in real-time	After stop/start



### TXF series – With Baumer FCAM a step ahead of DCAM

With the TXF series we offer our customers an additional refinement. We optimize the FireWire™ cameras specially for professional use in industrial systems. The cameras rely on asynchronous data transmission using a secure protocol, called Baumer FCAM. Besides the increased system reliability, for example, in the case of EMC environmental effects, the TXF cameras benefit from full utilization of a 80 MBytes/sec bus communication. This is a particular

advantage in multi-camera applications or setups with high-resolution cameras having a dynamic range greater than 8 bits. The TXF cameras can be reconfigured in a few milliseconds. In contrast to DCAM compatible systems, changes to the image format are possible without a FireWire™ stop/start. This opens up possibilities for fast real-time systems where the system reaction times are eliminated. The cameras can also be integrated very conveniently with the generic programming interface Baumer-GAPI.



# Technical data

## Excellent camera specifications

Besides the flexibility of the interface types, the cameras of the TX family stand out in particular because of their advanced sensor technology. An excellent **12 bit signal processing system** guarantees the highest level of image quality. Low noise and unstructured image information ensure reproducible image acquisition even under the most difficult conditions. The cameras also provide maximum detection reliability and precise results in demanding image processing tasks.

With a housing design measuring **36 mm x 36 mm x 48 mm** and a weight of 90 grams, these compact cameras can be integrated into even the smallest spaces.

To increase sensitivity, all cameras provide functions such as settings for gain, offset and exposure time. The **"True Partial Scan"** (ROI) selection mode, on the other hand, allows you to increase just the frame rate. Furthermore, the **"Binning"** function allows you to increase the sensitivity while simultaneously increasing the frame rate.

Exact synchronization of the camera to the process being monitored is provided by an industry-compliant **trigger and flash interface** found on the camera

housing. This interface is designed for automation applications and can be expanded in a flexible manner with additional digital inputs and outputs or interfaces. 32 MBytes image data memory ensures that, even with multi-camera solutions, all image data are transferred reliably at the highest speed. At the same time, customer-specific **"Smart Features"** can be implemented in the camera.



## The sensor versatility of the TX camera family

Camera model	Sensor type	Format	Resolution [Pixel]	Pixel size [µm]	Full frames [max. fps]
<b>Monochrome</b>					
TX...C03	CMOS	1/3"	752 x 480	6.0 x 6.0	60
TX...03	CCD	1/3"	656 x 494	7.4 x 7.4	90
TX...04 <sup>1)</sup>	CCD	1/2"	656 x 494	9.9 x 9.9	56
TX...06	CCD	1/2"	776 x 582	8.3 x 8.3	64
TX...08	CCD	1/3"	1032 x 776	4.65 x 4.65	28
TX...13	CCD	1/2"	1392 x 1040	4.65 x 4.65	20
TX...14	CCD	2/3"	1392 x 1040	6.45 x 6.45	20
TX...14f <sup>2)</sup>	CCD	2/3"	1392 x 1040	6.45 x 6.45	30
TX...20	CCD	1/1.8"	1624 x 1236	4.4 x 4.4	16
TX...50	CCD	2/3"	2448 x 2050	3.45 x 3.45	15 (13) <sup>2)</sup>
<b>Color</b>					
TX...C03c	CMOS	1/3"	748 x 476	6.0 x 6.0	60
TX...03c	CCD	1/3"	656 x 490	7.4 x 7.4	90
TX...06c	CCD	1/2"	776 x 578	8.3 x 8.3	64
TX...08c	CCD	1/3"	1032 x 772	4.65 x 4.65	28
TX...13c	CCD	1/2"	1384 x 1036	4.65 x 4.65	20
TX...14c	CCD	2/3"	1384 x 1036	6.45 x 6.45	20
TX...20c	CCD	1/1.8"	1624 x 1232	4.4 x 4.4	16
TX...50c	CCD	2/3"	2448 x 2050	3.45 x 3.45	15 (13) <sup>2)</sup>

... available as TXG (Gigabit Ethernet), TXF (FireWire™ IEEE1394b FCAM) and TXD (FireWire™ IEEE1394b DCAM)

<sup>1)</sup> available as TXG (Gigabit Ethernet); developed for high dynamic and measurement accuracy, the camera provides an optimized signal-to-noise ratio and best image quality

<sup>2)</sup> available as TXG (Gigabit Ethernet)

<sup>3)</sup> lower frame rates concerns TXD (FireWire™ IEEE1394b DCAM)

# Intelligent software integration

## The Baumer-GAPI – flexibility and simplicity in a programming interface

The Baumer-GAPI is a generic application programming interface (API) and is distinguished by its high degree of user friendliness, portability, stability and expandability. Simply put, it is easy to integrate any Baumer camera into your software environment. It supports the Windows and Linux (32/64 bit) operating systems with various programming languages (C, C++, C# for .NET™). Cameras with different hardware interfaces (Gigabit Ethernet and FireWire™ IEEE1394) can be operated uniformly and at the same time with one PC system.



## Our software partners

We work closely together with our software partners to ensure a perfect integration into their software packages.



## Third party software

Consistent support of standards such as GigE Vision™, GenICam™ and DCAM (IIDC V1.31) enables simple, trouble-free integration of the Baumer cameras with image processing software that also supports these standards.



and many other suppliers

# Innovation and versatility

## IP67 protection – more than just another camera housing

The new camera enclosure with its IP67 protection guards your camera not just against water and dust, it also prevents the manipulation of individual components by unauthorized persons. In addition to securing the TX camera of your choice, the housing also protects the necessary lens. The proper tube for your lens can be selected from different lengths. Industrial connectors ensure a reliable connection to your system.



## The right light at the right time – the smart lighting control system

A new flexible process interface provides convenient control of lighting modules for the TXG series cameras. Just one trigger pulse allows you to control up to four separate lighting systems independently. At the same time, a sequencer realizes the acquisition of

each image. The lighting properties can be configured as desired, permitting different brightness settings and flash durations. This can all be comfortably programmed using the Gigabit Ethernet interface.

## Competence that goes further – with the proper accessories to the complete system

A high quality image processing system needs more than just a camera. Combining all the components in just the right way guarantees the best image quality and the success of your application. Baumer helps you select the right accessories for the TX cameras and offers perfectly matched components for every type of interface. Whether you need cables, network components, mounts or lenses, with Baumer, you get everything you need from one, reliable source. Profit from our proven knowledge and professional support.



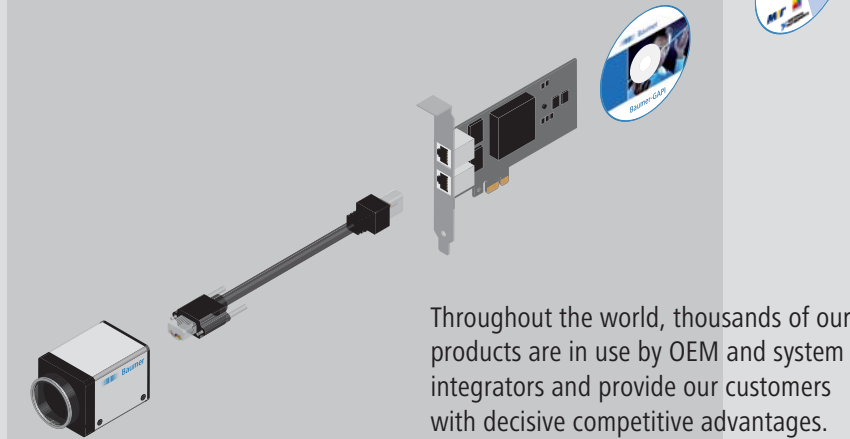
# Competence in vision technologies

With innovative technologies leading the way into the future

Finding the right imaging solution is simple when you work with skilled experts with many years of experience in vision technologies. Baumer's engineering and technical staff are dedicated to using their knowledge and practical understanding to develop next generation solutions for our customers. Our core competence covers all vision disciplines from the sensor to signal processing and to driver interfaces for fast integration into vision systems.



## Our core competence



Throughout the world, thousands of our products are in use by OEM and system integrators and provide our customers with decisive competitive advantages.

## Our competitive advantage is innovation

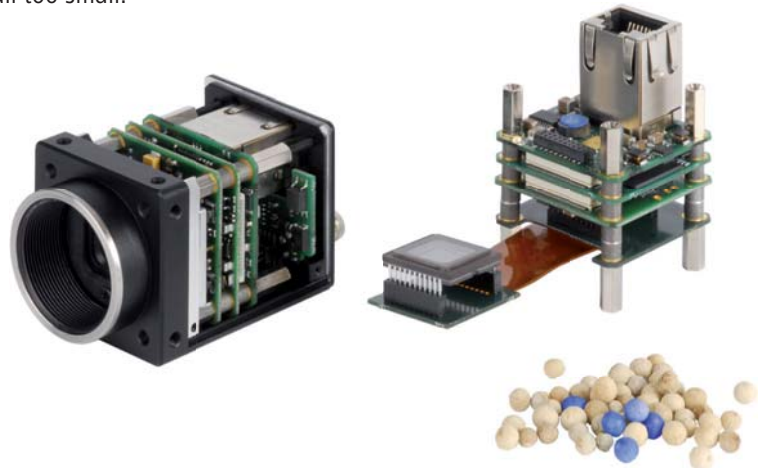
Our goal is to be on the cutting edge of imaging technology and to set new standards with our innovation. We continuously develop new products to meet the future needs of our customers in advance of their requirements.

## Customer-specific solutions from Baumer

We listen to our customers and work closely with them. Thanks to our optimal market presence, many solutions come from individual, on-site cooperation. For us, no challenge is too big, no detail too small.

## Quality and precision

We are committed to quality from the start and provide reliable products and solutions to benefit our customers. Baumer stands for capability, reliability and precision.



# Our values



## Our customers are our focus

Even though Baumer serves many different regions and markets, all Baumer employees everywhere follow the same core values. Partnership, precision and a pioneering spirit form the basis of our integrated corporate culture and dictate our actions.

The digital cameras of the TX family from Baumer –  
designed to keep you one step ahead

Are you feeling inspired? [www.baumeroptronic.com](http://www.baumeroptronic.com)



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