

Gigabit Ethernet – Adapter settings for improved network performance

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Description

In order to achieve maximum network performance together with Baumer industrial cameras, special network card settings are recommended. This document describes the features together with the appropriate settings.

Products

All Baumer Gigabit Ethernet cameras

Preparation

Since the following descriptions refer to Intel® Network Interface Cards as well as the related drivers for Windows® operating systems, a corresponding NIC and driver needs to be installed.

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1 Technical Background

- The following properties and options refer to Intel® Network Interface Cards as well as the related drivers for Windows® operating systems.
- Given hints are not meant as a universal remedy for any kind of Ethernet related issues.
- The described settings can be performed in addition to the necessary network configuration that is described within the Installation Guide.

2 Packet Size

Jumbo Packets are Ethernet packets that exceed the standard packet size of 1518 bytes.

Typical sizes are for example 4, 9, 12 or 16 KB depending on the NIC manufacturer.

They are used to decrease the interrupt load of all network devices involved. Thus all components within the network need to support Jumbo Packets.

In order to increase the network performance and decrease the PC's CPU load, it is recommended using the largest possible jumbo packet size. Baumer Gigabit Ethernet cameras support up to 9 KB.

Every time the PC receives an Ethernet packet, an interrupt takes place. The smaller the set packet size, the more interrupts will occur.

Any interrupt is disturbing the image transfer flow and causes CPU load due to several OS internal switchover processes.

For a stable and performant network communication choose the largest possible jumbo packet size which is supported by the camera as well as by the NIC.

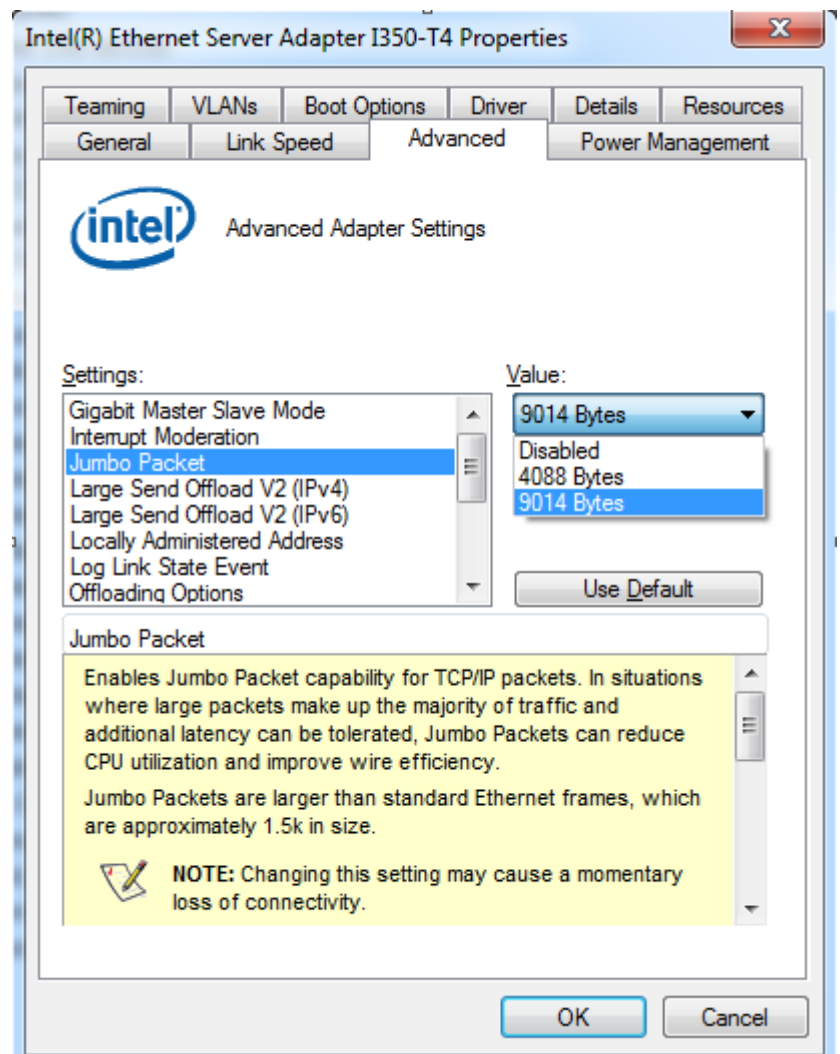


Figure 1: Jumbo Packet Settings

3 Interrupt Moderation Rate

Not only the packet size but also the interrupt moderation rate have an effect on the packet data to interrupt rate..

Once “Interrupt Moderation” (see screenshot in 1.1) is activated, the “Interrupt Moderation Rate” can be selected from the Performance Options window.

The moderation rate can be configured between “Minimal” allowing nearly every interrupt and “Extreme” allowing nearly no interrupt at all...

Selecting “Adaptive” means automatic interrupt processing based on Intel® algorithms for an optimum value in between.

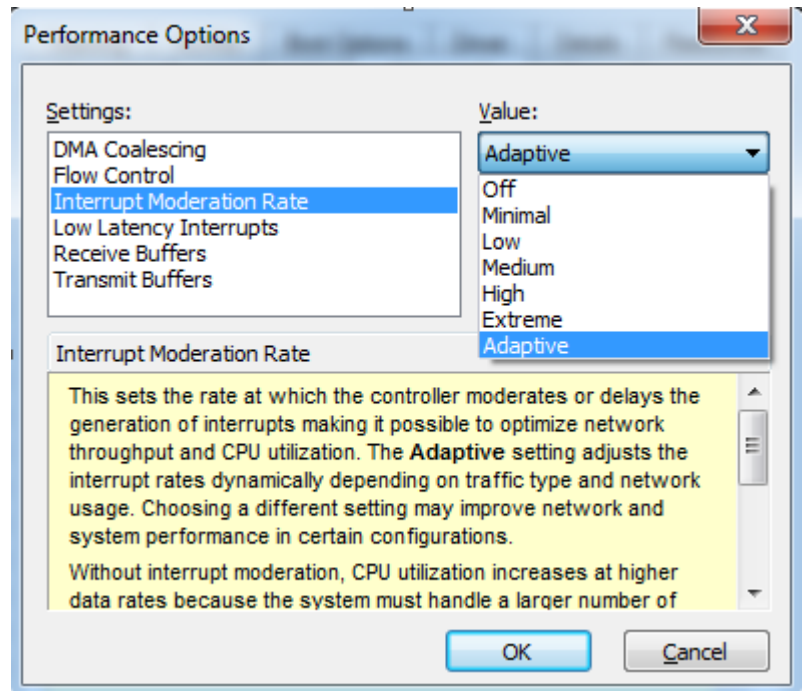


Figure 2: Interrupt Moderation Rate Settings

4 Receive Buffers

The NIC itself does not feature any buffer memory but the received data packets need to be buffered in order to compensate CPU load changes caused by the operating system. Therefore buffers are allocated in the PC's RAM.

In general, it is recommended to allocate as much receive buffers as possible. Baumer recommends a buffer number of 2048.

An increased buffer number will reduce the risk of resends.

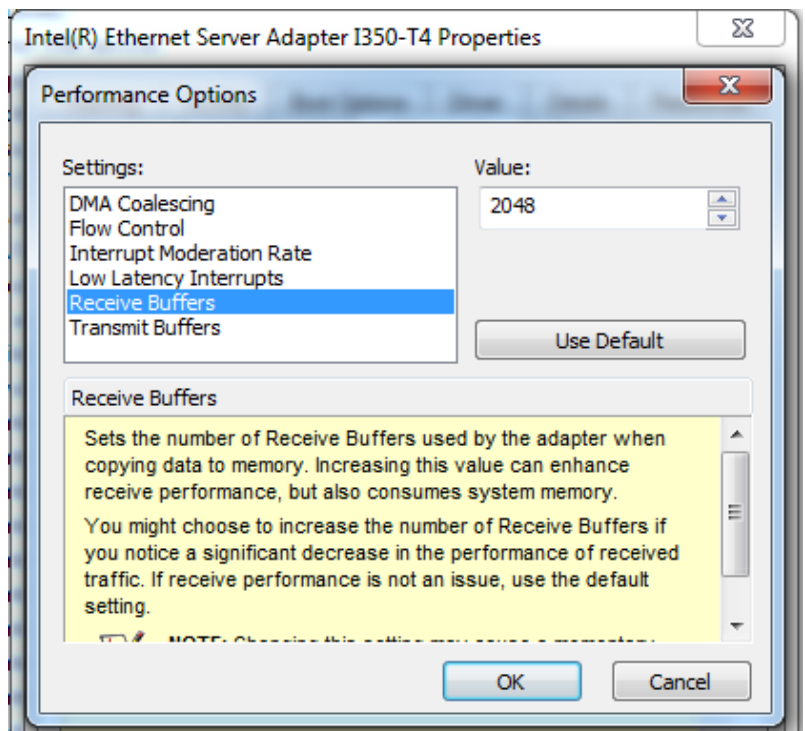


Figure 3: Receive Buffers Settings

5 Support

Please contact our Technical & Application Support Center with any questions.

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6 Legal information

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