



Item	Item-No.
bluecom CL	00019331-61
bluecom CL AMT	00019331-71
bluecom RT	00019331-63
bluecom DL	00020721-64
bluecom DL AMT	00020721-74

## bluecom

bluecom defines an open real-time transmission protocol optimized for the requirements of diverse Ethernet based network structures that have grown over time. Structures such as these can be found in the networking of alternative energy plants, for instance, the so-called virtual power stations.

bluecom connects hundreds of network devices deterministically and is not assigned to proprietary extensions of Ethernet standard IEEE 802.3. The user is free to choose the topology, the transmission medium and the transmission rate. As a result, bluecom render the most cost-efficient real-time networking of new and pre-existing systems possible.

- Real-time networking of more than 500 sub-stations with cycle time of less than 20 ms at 250 bytes of bidirectional data transmission
- Compatible with every MX, MPC, MH and MC series processor module
- Ethernet-based real-time protocol without specific requirements for networking topology
- Optimized for speed and bandwidth utilization
- Efficiency by design (low CPU and networking utilization)
- Hot-plug functionality when removing and adding network stations
- Parallel communication via the same interfaces and media, without impact on real-time capabilities (HTTP, FTP, video, VoIP etc.)
- Prioritization of Ethernet traffic acc. to IEEE 802.3q
- Configurable bandwidth limit
- Subnet formation and cascading
- Multi-master functionality
- Integrated error detection and diagnostics functionality
- Configurable I/O mapping of network variables
- Programming and diagnostic interface in IEC 61131-3 and C/C++

bluecom	
Rationale / Type / Compatibility	
Protocol type	Ethernet-based real-time protocol
Ethernet compatibility	Yes, as per IEEE 802.3q (ISO/OSI layer 1+2)
Registered IEEE Ethertype	0x892D
Transmission medium	Independent of transmission medium Wireless communication (802.11) permissible once the jitter Requirements have been taken care of
Gateway functionality	Interface of different network types on the application level
Fieldbus	CAN, Profibus DP, Profinet, Modbus UDP + TCP, EtherCAT
Control station level	Standard protocols: IEC61850, IEC61400-25, IEC60870-5-104, OPC DA, Modbus TCP/UDP Application development: Communication library M1Com and M1Com.NET
Topology / Networking	
Topologies	Star, bus, ring <sup>1)</sup> , mesh network
Dimension	In compliance with IEEE 802.3 - $\geq 2000$ m per network section via fiber optic connection
Transfer rates supported	100 Mbit/s, 1 Gbit/s <sup>1)</sup>
Time synchronization	Via PTP (IEEE 1588) <sup>2)</sup>
Switches / infrastructure	Standard Ethernet IEEE 802.3q
Parallel data traffic	Yes, possible Ethernet-based protocols and services, e. g. HTTP(S), FTP(S), SNTP, SMTP, video stream, Modbus, OPC, MMS etc.
Configuration / Programming	
Configuration	SolutionCenter (support via wizards)
Remote configuration	Yes (Ethernet LAN, Internet)
Network configuration	SolutionCenter (support via wizards)
Programming	IEC 61131-3, C/C++ user interfaces integrated, Library functions
Software interfaces	API for sending and receiving and for monitoring and checking the full and proper delivery of packets, as well as the management of I/O stations
Network variables	Yes (configuration of variables at the endpoints automatically generates bluecom communication channel)
Adding/removing slaves	Yes, possible (hot plug)

1) Employing appropriate network hardware

2) Accuracy achievable subject to CPU type used and master clock used

bluecom	
<b>Diagnostics / Monitoring</b>	
I/O live display	Yes (SolutionCenter, IEC 61131-3, C, C++)
I/O network variables	Yes, for every I/O channel (status, value)
Channel status	Yes, for every bluecom channel
Error status	Yes (SolutionCenter, IEC 61131-3, C, C++)
Diagnostics	Yes (SolutionCenter, IEC 61131-3, C, C++)
Statistics	Yes (SolutionCenter, IEC 61131-3, C, C++)
Network monitor	SolutionCenter
Network analysis	Yes (by Wireshark plug-in, Wireshark data are generated automatically on the controller)
Bandwidth limitation	Monitoring and limitation of real-time communication bandwidth use included (adjustable, pre-configured: 35 Mbit/s)
Jitter monitoring	Yes
QoS	Yes (IEEE 802.3q)
<b>Performance data</b>	
Number of I/O stations	Max. 500 *** (restricted by software)
Cycle time	200 $\mu$ s to 1 s *** (any intermediate values configurable)
Transmission frame cyclic	0 to 1400 bytes per payload unit
Transmission frame acyclic	32000 bytes per payload unit
Capacity under test conditions	Master CPU: MPC293, slave CPU: MX213, 10 ms cycle, 96 slaves, 50-byte cyclic data exchange bidirectional to each I/O station, transmission medium copper
CPU load only Protocol	Master: 17 %, slave: 1,7 %
CPU load (Protocol, GetData + SetData)	Master: 27 %, slave: 3 %
Network load	Master: 9 Mbit/s, slave: 0.082 Mbit/s
<b>Installation</b>	
Installation medium	CD ROM or network
Installation tool	SolutionCenter
Upgrading existing systems	By software possible / licence required
<b>System prerequisites</b>	
Automation equipment	M1 CPUs of the MX200 series or better (application licence) Porting information is available for implementation on external equipment (developer licence)
Software	MSys / MxCCore / M-BASE V3.80 or higher
Network	Industrial standard managed switch (unmanaged switch with appropriate configuration)

Order codes		
Item	Item no.	Description
bluecom CL	00019331-61	License to operate the bluecom communication software on any number of Bachmann controller CPUs (Redistribution exclusively together with CPU modules).
bluecom CL AMT	00019331-71	One year extension of product support and update delivery for the bluecom Company License.
bluecom RT	00019331-63	Runtime License to operate the bluecom communication software on one controller CPU. Enables the communication with one or several bluecom compliant devices. Extension of product support and update delivery is covered by a valid M-Base Annual Maintenance.
bluecom DL	00020721-64	License to develop bluecom compatible products on third party devices by any number of employees in one location (Porting License).
bluecom DL AMT	00020721-74	One year extension of product support and update delivery for the bluecom Porting License.