



| Part type designation | Part number |
|-----------------------|-------------|
| 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 transfer rate. As a result, bluecom render the most cost-efficient real-time networking of new and pre-existing systems possible.

Features

- 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 modules
- Ethernet-based real-time protocol without specific requirements for networking topology
- Optimized for velocity and bandwidth utilization
- Efficiency by design (low CPU and networking utilization)
- Hot-plug functionality when removing and adding network stations during operation
- Parallel communication via the same interfaces and media, without impact on real-time capabilities (HTTP, FTP, video, VoIP etc.)
- Priorization 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 diagnostics interface in IEC 61131-3 and C/C++

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| Rationale/Type/Compatibility | |
|--|--|
| Protocol type | Ethernet-based real-time protocol |
| Ethernet compatibility | Yes, acc. to IEEE 802.3q (ISO/OSI layer 1 + 2) |
| Registered IEEE Ethertype | 0x892D |
| Transmission medium | Independent of the transmission medium, wireless communication (802.11) permitted once the jitter requirements have been taken care of |
| Gateway functionality | Connection of different network types on the application level |
| Fieldbus | CAN, Profibus DP, Profinet, Modbus UDP + TCP, EtherCAT |
| Control station level | Standard protocols: IEC 61850, IEC 61400-25, IEC 60870-5-104, OPC DA, Modbus TCP/UDP Application development: Communication library M1Com and M1Com.NET |
| Topology/Networking | |
| Topologies | Star, bus, ring ¹⁾ , mesh network |
| Dimension | In compliance with IEEE 802.3 - ≥ 2000 m per network section via fiber optic connection |
| Transfer rates supported | 100 Mbit/s, 1 Gbit/s ¹⁾ |
| Time synchronization | Via PTP (IEEE 1588) ²⁾ |
| 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. |
| ¹⁾ Employing appropriate network hardware | |
| ²⁾ Accuracy achievable subject to CPU type used and master clock used | |
| 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) |
| Diagnostics/Monitoring | |
| 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 state | 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 plugin, 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) |

| Performance data | |
|--|---|
| Number of I/O stations | Max. 500 ¹⁾ (restricted by software) |
| Cycle Time | 200 µs to 1 s ¹⁾ (any intermediate values configurable) |
| Transmission frame cyclic | 0 bytes to 1400 bytes per payload unit |
| Transmission frame acyclic | 32 000 bytes per payload unit |
| Capacity under test conditions | Master CPU: MPC293, slave CPU: MX213, 10 ms cycle, 96 slaves, 50 bytes 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 |

¹⁾ Limit value depends on the performance of the controller and the network as well as the utilization of the controller and the network topology/load

| Installation | |
|----------------------------|---|
| Installation medium | CD ROM or network |
| Installation tool | SolutionCenter |
| Upgrading existing systems | By software possible / licence required |

| System requirements | |
|---------------------|---|
| Automation devices | M200 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 data

| Part type designation | Part number | 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 | Porting license: License to develop bluecom compatible products on third party devices by any number of employees in one location. |
| bluecom DL AMT | 00020721-74 | One year extension of product support and update delivery for the bluecom Porting License. |