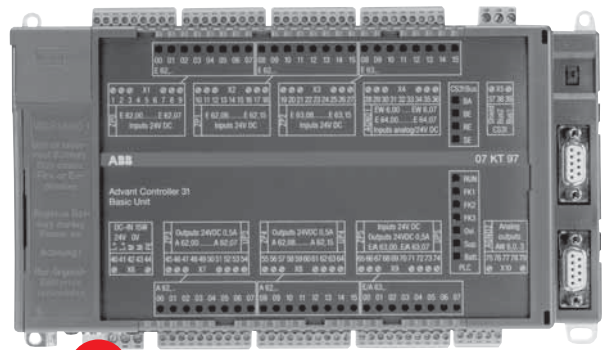


## ARCNET

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**ARCNET**  
(Attached Resource Computer NETWORK)  
ARCNET is an open, multi-purpose field bus solution with real-time capability. It can be used for multi-master networking and for programming the AC500 and AC31 controller series, but also for connecting additional ARCNET subscribers, e.g. PCs via an appropriate interface card (see catalog).

### Topology

ARCNET is one of the few networks that can be operated in every conceivable topology. Options include bus, star, or tree topologies, or mixtures of these. This means that ARCNET can be used for a broad field of different applications.

### Bus assignments

ARCNET operates on the token-passing procedure, where each subscriber has equal rights.

### Configuration mechanisms

ARCNET allows to add and to remove subscribers from the network during runtime. When a new subscriber is added, the entire network will be re-configured.

### Security mechanisms

A 16-bit CRC is appended to every data packet, and checked by the recipient. If the token is lost, a reconfiguration routine will be initiated, and the network will automatically be restructured. Additionally, diagnostic registers are available.

### Physical characteristics

ABB recommends coaxial cables as transmission medium, for direct connection to the CPU. But also twisted-pair cables or (glass, plastic) fiber-optic cables can be connected via bus converters. The line lengths that can be achieved without any intermediate amplifiers depend not only on the used medium, but also on the selected baud rate and the number of subscribers. The ranges per segment vary from approximately 120 m for a simple two-wire bus, up to 3 km for fiber-optics, in each case at 2.5 MBit/s. By providing appropriate hubs, different topologies and transmission media can be combined with each other and the transmission distance can be increased. The coaxial cables used are a type with 93 Ohm, e.g. RG 62.

The permissible twisted-pair cables are specified in IEEE 802.3i-1990. At 2.5 MBit/s and with coaxial cables, for example, the maximum length of a bus segment is 300 m with eight subscribers and without a hub. With twisted-pair cables, under the same conditions, a maximum length of approximately 120 m can be achieved. The maximum transmission length depends on the number of connected subscribers. With coaxial cables, a maximum of 16 km can be achieved; with twisted-pair cables approximately 6 km, in each case at 2.5 MBit/s. The fiber-optic link provides the highest degree of interference immunity. With glass fiber-optics, distances of up to 3 km are possible at 2.5 MBit/s; with plastic fiber-optic cables only small distances of up to approximately 100 m. The baud rate plays no significant role in fiber-optic cable transmission. Here, the range can as well be extended using hubs.

### Diagnostics

Detailed diagnostic messages for rapid trouble-shooting are shown on the CPU display.

### ARCNET – the functionality at a glance

- Guaranteed collision-free data transmission, guaranteed response times and real-time capability thanks to token-passing
- Large network dimensions: network length 300 m, with amplifier max. 16 km
- Secure, thanks to checksums in the data packet and hand shake protocol between transmitter and receiver
- Variable network structure: bus, tree and star topologies are possible, plus any desired mixtures of them
- Variable networking media, coaxial cables, twisted-pair cables and fiber-optic cables can be mixed
- Automatic subscriber log-on and log-off; the network automatically incorporates new stations in the ring and cancels them as well
- Master-master access: the subscriber that holds the token is the master. With up to 255 masters at the same network
- Data transmission rate of max. 2.5 MBit/s
- ARCNET is configured and programmed using the AC500 Control Builder engineering tool