

RFC1006 Lib

TCP/IP DLL

RFC 1006

ISO on TCP

Version 1.02



Requirements:

Operating system: MS-Windows 95/98/2000/NT 4.0/ XP/Vista/7

Hardware: PC with installed TCP/IP protocol and network interface

Delivery:

You will find as follows

root dir	
Rfc1006lib-en.pdf	This document

Directory `C`	Files for für C / C++
Rfc1006lib.h	Header file for für C / C++
Rfc1006lib.dll	driver DLL
Rfc1006lib.lib	Lib file for linking with C/C++
Rfc1006demo.dsp	project file for Visual C++ V 6.00
Rfc1006demo.c	C-source sample program
Rfc1006demo.exe	EXE sample C-Demo

Function:

RFC1006-Lib is a DLL for MS-Windows (95/98/2000NT/XP), which allows connecting a PC to Industrial Ethernet over RFC-1006. With simple functions, the user can quickly make connections with C, C + +, Delphi, Visual Basic or Excel based on RFC 1006 for sending and receiving data. For coupling, only the IP address, DSAP, SSAP of the partner is required. RFC1006 by default uses port 102. Using the library in operation as a server note the following functions: **RFC1006StartServer**, **RFC1006StopServer**, **RFC1006GetStatus**

Function description in detail:

Please note: The functions are executed using the standard socket interface, means that the calling thread may be blocked until the function returns. For asynchronous operation, you call these functions easily from a separate thread to off, which is responsible for the communication of your system.

Server mode:

Using the library in operation as a server note the following functions:

Rfc1006OpenServer

Rfc1006GetStatus

Rfc1006StartServer

Otherwise, the functions and **Rfc1006Rx** and **Rfc1006Tx** can be used for communication. It is advisable to check periodically with **Rfc1006GetStatus** whether a connection exists. And then use only **Rfc1006Rx** and **Rfc1006Tx** for receiving and transmitting data.

This functions are available:

Functions for initialization:

<i>Function</i>	<i>Description / Purpose</i>
Rfc1006Open	To initialize the connection, there is only memory prepared. The first time using the read / write functions, TCP/IP – RFC 1006 connection starts automatically. (Use only when running as a client!)

Parameter:

No.	Memory width	Name	Function
1	32 bit pointer to null terminated string	IPAdr	IP-Adresse oft he PLC in format: xxx.xxx.xxx.xxx. e.g.: 192.169.0.100
2	32 bit pointer to null terminated string	SSAP	Own SAP, max. length of string is 255

3	32 bit value unsigned	SSAPLen	Length of own SAP, max. 255 chars are used
4	32 bit pointer to null terminated string	DSAP	SAP of partner, max. 255 chars are used
5	32 bit value unsigned	DSAPLen	Length of partner SAP, max. 255 chars are used
6	32 bit value unsigned	PortNr	Number of the TCP / IP ports to be used for this connection. Default is 102. If set this value to 0, then 102 is used by default.
7	32 bit value unsigned	ConnectTimeout	Timeout in milliseconds to wait for connecting with the partner. 0 means default = 5000 ms (5sec.) must be changed if necessary.

Function	Description / Purpose
Rfc1006OpenServer	Creates a new connection for operation in server mode. Connection will not be started with this function. Only a possible new connection is created. The start of the connection is controlled by Rfc1006StartServer . Here just the memory is being prepared. (Use only when running as a server!)

Parameter:

No.	Memory width	Name	Function
1	32 bit pointer to null terminated string	DstIPAdr	IP address of the client, which may start a connection to the server. e.g.: 192.169.0.100
2	32 bit pointer to null terminated string	SSAP	Own SAP, max. length of string is 255
3	32 bit value unsigned	SSAPLen	Length of own SAP, max. 255 chars are used
4	32 bit pointer to null terminated string	DSAP	Length of partner SAP, max. 255 chars are used
5	32 bit value unsigned	DSAPLen	Length of partner SAP, max. 255 chars are used

Return value:

The function returns a 32 bit signed value as follows:

Value	Description	Purpose
> 0	Function returns with no error	Return value is the number of the reference for this connection. Is to be used as input parameter for the other functions.
-2	No more free resources.	Maximum number of available connections reached.

Function	Description / Purpose
Rfc1006StartServer	Sarts the server with the connections created with Rfc1006OpenServer . (Use only in server mode!)

Parameter:

No.	Memory width	Name	Function
1	32 bit value	Port	TCP/IP port number the server is listening for incoming connection. If 0 default 102 is used (102 is the

			RFC1006-Port)
2	32 bit pointer to null terminated string	IPBindAdr	IP address of the network card where the server should use for communication. NULL or zero string uses all network cards
3	32 bit value	MaxCon	Maximum number of connections the server may support.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Bedeutung
> 0	Function returns with no error	Server wurde gestartet.
-1	Server läuft bereits.	Rfc1006StartServer wurde bereits aufgerufen.
-2	Server kann nicht gestartet werden	Fehler beim Starten des Serverthreads aufgetreten.

<i>Function</i>	<i>Description / Purpose</i>
Rfc1006StopServer	Stops the server. (Use only in server mode!)

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Bedeutung
> 0	Function returns with no error	Server is stopped.
-1	Server was not running.	RFC1006StartServer was not called

<i>Function</i>	<i>Description / Purpose</i>
Rfc1006Close	Closes the connection. Memory is freed and the TCP/IP connection will be closed.

Parameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Purpose / reaction
0	Function returns with no error	Memory freed, connection closed
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?
-99	„Ref“ isn't valid	-----

Functions for receiving and transmitting

<i>Function</i>	<i>Description / Purpose</i>
Rfc1006Rx	Try to receive data via RFC 1006. If there is no connection to the partner. It will be previously established (only in client mode). If in server mode there is no connection to the partner, the function will return immediately with -1.
Rfc1006Tx	Transmit data on RFC 1006 to the partner. If there is no connection to the partner. It will be previously established (only in client mode). If in server mode there is no connection to the partner, the function will return immediately with -1.

Parameter:

Die Lese- und SchreibFunktionen besitzen die selben Eingangparameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.
2	32-Bit Adresse	Buffer	Pointer to source / destination memory in PC
3	32 bit value unsigned	Cnt	Using Rfc1006Rx maximum size of Rx-Buffer in bytes. Using Rfc1006Tx number bytes to be transmitted.
4	32 bit value signed	Timeout	Timeout in ms for transmitting or receiving 0 = not blocking 1 = blocking, waits maximum Timeout ms for receiving or transmitting

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Reaction
>=0	number of transmitted / received data bytes	
-1	timeout, partner not reachable or not yet online	Just start more transmitting and reading jobs. The driver opens the connection automatically. Possibly. May be you have to adjust the timeout values.
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?
-5	general error	Check whether network is properly installed in the PC TCP/IP activated? WinSocket installed?
-6	partner not found	Number of port in Rfc1006Open not correct or there is no more connection available to this port. Check configuration!
-7	socket error happened	Call Rfc1006GetSockErr to get the number of socket error. For details see the list below of the document.
-99	Number of reference invalid	Did you call Rfc1006Open?
4660	time of demo license expired	order a full licence version

Function	Description / Purpose
Rfc1006GetSockErr	Returns the last socket error.

Parameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Purpose / reaction
0	Function returns with no error	Actually no error
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?

-99	„Ref“ isn't valid	-----
other	Socket error	see list bellow

Function	Description / Purpose
Rfc1006GetStatus	Returns the status of connection

Parameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Purpose / reaction
0	connection not established	
1	connection established	
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?
-99	„Ref“ isn't valid	-----
other	Socket error	see list bellow

Function	Description / Purpose
Rfc1006Connect	Connects to partner

Parameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Purpose / reaction
0	connection not established	
1	connection established	
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?
-99	„Ref“ isn't valid	-----

other	Socket error	see list bellow
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Function	Description / Purpose
Rfc1006Disconnect	Disconnect to partner.

Parameter:

No.	Memory width	Name	Function
1	32 bit value unsigned	Ref	The reference of connection. Returned by Rfc1006Open. Is used to identify the connection internally.

Return value:

The function returns a 32 bit signed value as follows:

Wert	Description	Purpose / reaction
0	connection closed	
1	connection could not be closed	
-3	The passed „Ref“ was not returned by Rfc1006Open	Did you call Rfc1006Open?
-99	„Ref“ isn't valid	-----
other	Socket error	see list bellow

List of socket error. You can get a full list by Microsoft

Name	Code	Purpose
WSAEINTR	10004	Call was interrupted
WSAEBADF	10009	
WSAEACCES	10013	access error
WSAEFAULT	10014	parameter wrong
WSAEINVAL	10022	<ol style="list-style-type: none"> 1. An other function must be called before 2. Socket was already bound to address 3. Socket not bound to address or yet conneted
WSAEMFILE	10024	resources not available (files, queues)
WSAEWOULDBLOCK	10035	call would block
WSAEINPROGRESS	10036	parallel calls not allowed
WSAEALREADY	10037	interrupted routine already ready
WSAENOTSOCK	10038	socket not valid
WSAEDESTADDRREQ	10039	dest address needed
WSAEMSGSIZE	10040	datagram to large
WSAEPROTOTYPE	10041	
WSAENOPROTOOPT	10042	unknown socket optiopn
WSAEPROTONOSUPPORT	10043	protocol was not supported
WSAESOCKTNOSUPPORT	10044	type of socket is not supported in address family passed

WSAEOPNOTSUPP	10045	this kind of socket ist not supported
WSAEPFNOSUPPORT	10046	Family of protocol is not supported
WSAEAFNOSUPPORT	10047	Family of protocol is not supported
WSAEADDRINUSE	10048	ip address or port is already in use
WSAEADDRNOTAVAIL	10049	port / address not available
WSAENETDOWN	10050	no reaction from network
WSAENETUNREACH	10051	network can't be reached
WSAENETRESET	10052	connection reset by TCP/IP
WSAECONNABORTED	10053	connection interrupted by TCP/IP
WSAECONNRESET	10054	partner did reset connection
WSAENOBUFS	10055	no resources (Buffer)
WSAEISCONN	10056	socket already exists
WSAENOTCONN	10057	socket not yet exists
WSAESHUTDOWN	10058	partner closed connection
WSAETOOMANYREFS	10059	
WSAETIMEDOUT	10060	Timeout
WSAECONNREFUSED	10061	connection refused
WSAELOOP	10062	
WSAENAMETOOLONG	10063	
WSAEHOSTDOWN	10064	
WSAEHOSTUNREACH	10065	Host not reachable
WSAENOTEMPTY	10066	
WSAEPROCLIM	10067	
WSAEUSERS	10068	
WSAEDQUOT	10069	
WSAESTALE	10070	
WSAEREMOTE	10071	
WSASYSNOTREADY	10091	network not ready
WSAVERNOTSUPPORTED	10092	desired version of win socket not supported
WSANOTINITIALISED	10093	Socket init must be called
WSAHOST_NOT_FOUND	11001	DNS-Server not found
WSATRY_AGAIN	11002	retry again
WSANO_RECOVERY	11003	unrecoverable error
WSANO_DATA	11004	no data available
WSANO_ADDRESS	11004	

Function declarations

C-Header:

long WINAPI

Rfc1006Open (LPCSTR IPAdr, BYTE *SSAP, DWORD LenSSAP, BYTE *DSAP, DWORD LenDSAP, DWORD Port, DWORD ConnectTimeout);

long WINAPI

Rfc1006Close (long Ref);

long WINAPI

Rfc1006Rx (long Ref, void *Buf, DWORD MaxCnt, long RxTimeout);

long WINAPI

Rfc1006Tx (long Ref, void *Buf, DWORD Cnt, long Timeout);

long WINAPI

Rfc1006GetSockErr (long Ref);

long WINAPI

Rfc1006Connect (long Ref);

long WINAPI

Rfc1006Disconnect (long Ref);

long WINAPI

Rfc1006GetStatus (long Ref);