Application Protocol Specification

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DOCUMENT HISTORY

Revision	Notes	Date
1	Initial release	2020-08-04
2	**Fixed** • Typo in the table in the section 1.1 (the port number should be 6999)	2021-05-30

	• Typo in the description of the section 2 • Bit counting in the section 3.8.2 • Interpreter type in the section 3.6.1 must be INT16 **Added** • 1.5. SOFTWARE VERSIONING • 2.7. PROXY LISTENING ADDRESS REQUEST • 2.8. PROXY LISTENING PORT REQUEST • 2.9. PROXY ENABLED REQUEST • 3.8.5. MESSAGE #17. PERFORM PROXY BENCHMARK • 3.9. MESSAGES FOR FILE OPERATIONS **Changed** • 1.4. DATA TYPES • 2.3. PROXY VERSION REQUEST • 3.4. MESSAGE TYPES • 3.5.1. MESSAGE #0. READ VARIABLE (ASCII) • 3.5.5. MESSAGE #4. READ VARIABLE • 3.5.7. MESSAGE #6. READ MULTIPLE VARIABLES • 3.5.8. MESSAGE #7. WRITE MULTIPLE VARIABLES • 3.8.1. MESSAGE #13. GET PROXY INFORMATION	
3	**Fixed** • Recommended minimum version in the section 3.5.8	2021-06-06
4	**Important** The documentation has migrated to HTML format **Fixed** • The word "inter process" in TERMS USED • Request size in 2.7 (it must be 14) • Byte offset in 3.5.6 • The word "Submit" in 3.6.1 • The word "Submit" in 3.7.2 • Invalid message ID of 3.10.1 (it must be 63)	2022-02-10

	Added • List of contributors in COPYRIGHT • Hexadecimal representation in sample messages **Changed** • SOFTWARE VERSIONING section has been renumbered from 1.5 to 1.1 • Response examples in 2.9 • Sample request/response in 3.5.2 • Sample request/response in 3.5.6 • Sample request/response in 3.5.8 • Sample response in 3.8.2	
5	**Fixed** • Missing "Key Status" field in 3.7.2 • Wrong value of field "All" in 3.9.1.6	2022-03-24
6	**Added** • 1.6. APPLICATION SETTINGS **Changed** • Copyright information on the title page • COPYRIGHT section	2024-01-26
7	**Added** • 64-bit integer types in 1.5 • 3.9.1.9. Volume Types • 3.9.19. MESSAGE #31. GET VOLUME PROPERTIES • 3.9.20. MESSAGE #32. SET VOLUME NAME • 3.9.21. MESSAGE #33. LIST OF AVAILABLE VOLUMES **Changed** • Title of 3.9	2024-04-15

TABLE OF CONTENTS

TERMS USED

Term	Description
IP	Internet Protocol The Internet Protocol (IP) is the principal communications protocol in the Internet protocol suite. It is responsible for addressing host interfaces, encapsulating data into datagrams (including fragmentation and reassembly) and routing datagrams from a source host interface to a destination host interface across one or more IP networks.
TCP/IP	Transmission Control Protocol The Transmission Control Protocol provides a communication service at an intermediate level between an application program and the Internet Protocol. It provides host-to-host connectivity at the transport layer of the Internet model.
UDP/IP	User Datagram Protocol UDP is a simple message-oriented transport layer protocol that is documented in RFC 768. Although UDP provides integrity verification (via checksum) of the header and payload, it provides no guarantees to the upper layer protocol for message delivery and the UDP layer retains no state of UDP messages once sent.
KRC	KUKA Robot Controller
KRL	KUKA Robot Language KUKA Robot programming language.
KUKA Cross 3	Internal mechanism of inter process communication in the KUKA robot control system.
KukavarProxy	KukavarProxy is a TCP/IP server that allows KRL variables to be read and written over a network connection.

1. OVERVIEW

This document describes the protocols used by the C3 Bridge Interface Server. The C3 Bridge Interface Server is a lightweight network application that allows remote clients to execute requests to KUKA Cross 3 subsystem and return responses. The application provides advanced functionality and high performance.

1.1. SOFTWARE VERSIONING

All products in the C3 Bridge family use versions consisting of three or, in some cases, four numbers. The first two numbers represent the major and minor components of the version. The third number denotes the type of build shown in the table below. The fourth number can only be used for internal builds.

Version Number	Build Type
0	Open Source
1	Proprietary
2	Freeware
3	Internal Build

1.2. TYPES AND PURPOSE OF PROTOCOLS

The C3 Bridge Interface Server can use two network protocols.

The first protocol, called the Discovery Protocol, is based on UDP and can be used to detect a remote server and find out its capabilities. The Discovery Protocol can operate in legacy or standard mode, or both. The legacy mode is implemented for compatibility with KukavarProxy features.

The second protocol is the primary one. It is based on TCP and is designed for remote interaction with the KUKA robot control system.

The table below shows a summary of the protocols and network ports on which

they operate by default.

Protocol	Based on	Listening port	Port to answer	Support in KukavarProxy
Discovery (legacy)	UDP	6999	7000	Yes
Discovery (standard)	UDP	7000	source port of peer	
Primary	TCP	7000	—	Yes, limited

1.3. BYTE ORDER

All multibyte fields in protocol messages are composed using the network byte order (or big-endian, most significant byte is transmitted first). Although this is in contradiction with the Intel IA-32 platform byte order (little-endian), the network byte order was chosen to provide compatibility with the KukavarProxy protocol.
The exceptions to this order are characters and strings in UTF16 format. The system byte order (little-endian) is used for them.

1.4. HEXADECIMAL NUMBERS

Base 16 (hexadecimal) numbers are represented by a string of hexadecimal digits followed by the character "h" (for example, 0D0Ah). A hexadecimal digit is a character from the following set: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, and F.

1.5. DATA TYPES

The following table gives information about the types of data used:

Name	Description	Size (bytes)	Range	
			MIN	MAX
UINT8	Unsigned Integer, 8−bit	1	0	255
INT8	Signed Integer, 8−bit	1	-128	127
UINT16	Unsigned Integer, 16−bit	2	0	65535

INT16	Signed Integer, 16−bit	2	-32768	32767
UINT32	Unsigned Integer, 32−bit	4	0	4294967295
INT32	Signed Integer, 32−bit	4	-2147483648	2147483647
UINT64	Unsigned Integer, 64−bit	8	0	2^{64} - 1
INT64	Signed Integer, 64−bit	8	$-2^{64} / 2$	$2^{64} / 2$ - 1
BOOL	Boolean Type	1	0	1[1]
CHAR	ASCII / ISO/IEC 8859−1 Character	1		
STRING	ASCII / ISO/IEC 8859−1 String	*variable*		
WCHAR	Unicode Character (encoded in UTF−16LE)	2		
WSTRING	Unicode String (encoded in UTF−16LE)	*variable (even)*		
BINARY	Binary Data (array of UINT8)	*variable*		

NOTES

1. The Boolean value is encoded with one byte. This means that the actual value of this field may be between **0** and **255**. The recipient must treat all non-zero values as TRUE and **0** as FALSE. The sender must encode the TRUE value with **1** and the FALSE value with **0**.

1.6. APPLICATION SETTINGS

The C3 Bridge Interface stores its settings in the `HKEY_CURRENT_USER\Software\C3 Bridge Interface` section of the Windows Registry. The most significant options can be set using command line arguments at the time the application is started.

All options except `−debug` and `−verbose` are only available in version 1.7.1 (Proprietary) and newer.

Parameter	Description

`-defaults`	Sets all settings to default values.
`-debug`	Sets the logging level to *Debug* and does not minimize the main window to the tray at startup. Registry Parameter: `LogSeverity`
`-verbose`	Sets the logging level to *Verbose*. Registry Parameter: `LogSeverity`
`-logSeverity <value>`	**Possible Values:** 1 - 6 Sets the desired logging level: 1. Fatal 2. Error 3. Warning 4. Info 5. Debug 6. Verbose Registry Parameter: `LogSeverity` Default Value: `4`
`-logLimit <value>`	**Possible Values:** 0 - 65536 Sets the maximum number of log lines. A zero value removes the software limit and leaves it to the discretion of the operating system. Registry Parameter: `LogLimit` Default Value: `4000`
`-tcpAddress <value>`	**Possible Values:** IPv4 address Sets the IP address where the primary protocol server (TCP) will listen. Registry Parameter: `NetworkTcpAddress` Default Value: `0.0.0.0`

`-tcpPort <value>`	**Possible Values:** 0 - 65534 Sets the network port on which the primary protocol server (TCP) will listen. A zero value has a special meaning and disables the protocol completely. Registry Parameter: `NetworkTcpPort` Default Value: `7000` Registry Parameter: `NetworkTcpEnabled` Default Value: `1`
`-udpAddress <value>`	**Possible Values:** IPv4 address Sets the IP address where the discovery protocol server (UDP) will listen. Registry Parameter: `NetworkUdpAddress` Default Value: `0.0.0.0`
`-udpPort <value>`	**Possible Values:** 0 - 65534 Sets the network port on which the discovery protocol server (UDP) will listen. A zero value has a special meaning and disables the protocol completely. Registry Parameter: `NetworkUdpPort` Default Value: `7000` Registry Parameter: `NetworkUdpEnabled` Default Value: `1`
`-legacyPort <value>`	**Possible Values:** 0 - 65534 Sets the network port on which the legacy discovery protocol server (UDP) will listen. A zero value has a special meaning and disables the protocol completely. Registry Parameter: `NetworkUdpLegacyPort`

	Default Value: `6999` Registry Parameter: `NetworkUdpLegacyEnabled` Default Value: `1`
`-legacyPeerPort <value>`	**Possible Values:** 1 - 65534 The remote port number to which the response from the legacy discovery server (UDP) will be sent. Registry Parameter: `NetworkUdpLegacyPeer` Default Value: `7000`

USAGE EXAMPLE

```
C3Bridge.exe -debug -tcpPort 7001
```

2. DISCOVERY PROTOCOL

The Discovery Protocol uses the UDP datagrams that contain text messages of a predetermined length. In the legacy mode, the sender makes requests to the server on port 6999 and the server responds to port 7000 of the sender. In standard mode, the sender makes requests to the server on port 7000, and the server responds to the sender's address and port, allowing the sender to use any port to receive responses.

2.1. PRESENCE REQUEST

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: Yes

PURPOSE

Determination of the control system address and readiness of the control

system to process requests of the primary protocol (indirectly).

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	12	STRING	WHEREAREYOU?

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	*variable*	STRING	KUKA|*<model name>*|*<serial #>*

NOTES

<model name> is the value of **$MODEL_NAME[]** KRL variable.

<serial #> is the value of **$KR_SERIALNO** KRL variable.

NEGATIVE RESPONSE

In case of an error when accessing the KUKA Cross 3 subsystem, the fields *<model name>* and *<serial #>* may be empty. In this case, the response has the following form:

Offset (bytes)	Size (bytes)	Type	Value
0	6	STRING	KUKA||

2.2. PROXY TYPE REQUEST

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Determining the type of proxy server. The C3 Bridge Interface responds to this request and KukavarProxy does not.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	11	STRING	@PROXY_TYPE

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	19	STRING	C3 BRIDGE INTERFACE

2.3. PROXY VERSION REQUEST

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Obtaining information about the application version and license type.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	14	STRING	@PROXY_VERSION

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	*variable*	STRING	*<major>.<minor> <type>*

NOTES

<major> is the major number of the software version.

<minor> is the minor number of the software version.

<type> is the type of the software edition (look at section 1.1. SOFTWARE VERSIONING), it can be (OPEN SOURCE), (PROPRIETARY), (FREEWARE), or (INTERNAL BUILD).

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	17	STRING	1.0 (OPEN SOURCE)

2.4. PROXY FEATURES REQUEST

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Determining the list of supported messages for the primary protocol.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	15	STRING	@PROXY_FEATURES

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Value	Meaning
R E Q U I R E D	-1	1	CHAR	1	Message #0 is available
				0	Message #0 is NOT available
	-2	1	CHAR	1	Message #1 is available
				0	Message #1 is NOT available
	...				
	-8	1	CHAR	1	Message #7 is available
				0	Message #7 is NOT available

	Offset	Size	Type	Value	Meaning
O **P** **T** **I** **O** **N** **A** **L**	-9	1	CHAR	1	Message #8 is available
				0	Message #8 is NOT available
	...				
	-256	1	CHAR	1	Message #255 is available
				0	Message #255 is NOT available

NOTES

Negative offset means bytes counted from the end of the received datagram. For example, -1 means the last byte, -2 means the penultimate byte, etc.

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value	Meaning
-1	1	CHAR	1	Message #0 is available
-2	1	CHAR	1	Message #1 is available
-3	1	CHAR	0	Message #2 is NOT available
-4	1	CHAR	0	Message #3 is NOT available
-5	1	CHAR	1	Message #4 is available
-6	1	CHAR	1	Message #5 is available
-7	1	CHAR	1	Message #6 is available
-8	1	CHAR	1	Message #7 is available
-9	1	CHAR	0	Message #8 is NOT available
-10	1	CHAR	0	Message #9 is NOT available
-11	1	CHAR	1	Message #10 is available
-12	1	CHAR	1	Message #11 is available

-13	1	CHAR	1	Message #12 is available
-14	1	CHAR	1	Message #13 is available
-15	1	CHAR	1	Message #14 is available
-16	1	CHAR	0	Message #15 is NOT available

NOTES

In this example, the string representation of the received data is as follows:

`0111110011110011`.

2.5. COMPUTER NAME REQUEST

Minimum supported version: 1.0.0 (Open Source)

Support in KukavarProxy: No

PURPOSE

Obtaining the computer name on which the robot control system is located.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	15	STRING	@PROXY_HOSTNAME

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	*variable*	STRING	*<KRC hostname>*

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	9	STRING	C010-07VM

2.6. DATE AND TIME REQUEST

Minimum supported version: 1.0.0 (Open Source)

Support in KukavarProxy: No

PURPOSE

Obtaining the date and time set on the robot control system in ISO 8601 format.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	11	STRING	`@PROXY_TIME`

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	20	STRING	`YYYY-MM-DDThh:mm:ssZ`

NOTES

[YYYY] indicates a four-digit year, 1601 through 9999.

[MM] indicates a two-digit month of the year, 01 through 12.

[DD] indicates a two-digit day of that month, 01 through 31.

[DD] indicates a two-digit day of that month, 01 through 31.

[T] is just ANSI character `T`, which is used to separate the date and time.

[hh] refers to a zero-padded hour between 00 and 23.

[mm] refers to a zero-padded minute between 00 and 59.

[ss] refers to a zero-padded second between 00 and 59.

[Z] means that the Coordinated Universal Time (UTC) is used.

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	20	STRING	`2020-08-04T06:46:10Z`

2.7. PROXY LISTENING ADDRESS REQUEST

Minimum supported version: 1.2.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Obtaining the TCP/IP address where the primary C3 Bridge Interface protocol is listening. The address 0.0.0.0 means that listening is performed on all available network interfaces.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	14	STRING	@PROXY_ADDRESS

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	*variable*	STRING	*<TCP/IP address>*

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	7	STRING	0.0.0.0

2.8. PROXY LISTENING PORT REQUEST

Minimum supported version: 1.2.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Obtaining the TCP/IP port where the primary C3 Bridge Interface protocol is listening.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	11	STRING	@PROXY_PORT

RESPONSE

Offset (bytes)	Size (bytes)	Type	Value

Offset (bytes)	Size (bytes)	Type	Value
0	*variable*	STRING	*<TCP/IP port>*

SAMPLE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	4	STRING	7000

2.9. PROXY ENABLED REQUEST

Minimum supported version: 1.2.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Getting information about the status of the TCP/IP server of the primary protocol.

REQUEST

Offset (bytes)	Size (bytes)	Type	Value
0	14	STRING	@PROXY_ENABLED

POSITIVE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	4	STRING	TRUE

NEGATIVE RESPONSE

Offset (bytes)	Size (bytes)	Type	Value
0	5	STRING	FALSE

3. PRIMARY PROTOCOL

The primary protocol uses long-term TCP/IP sessions. Data exchange takes place using binary messages of variable length. Transmitted messages are divided into requests and responses. The requests contain only the header and payload. The responses contain the header, payload, and error code at the end of the message. The server has the right not to reply to unknown or incorrect requests.

3.1. MESSAGE HEADER

Each message begins with a header, the structure of which is shown in the table below.

Offset (bytes)	Size (bytes)	Type	Meaning
0	2	UINT16	**Tag ID** This field specifies the message identifier. The response from the server will contain the same identifier as the request. This identifier does not define the type of request and can accept any values in the range from 0 to 65 535.
2	2	UINT16	**Message Length** The full length of the message, excluding the Tag ID and Message Length fields.

4	1	UINT8	**Message Type** An important field that defines the type of message. The message type indicates the number of the function that will be or has been executed by the C3 Bridge Interface.

3.2. RESPONSE FOOTER

Each response message ends with a footer, the structure of which is shown in the table below.

Offset (bytes)	Size (bytes)	Type	Meaning
0	2	UINT16	**Error Code** The error codes are listed in the next section.
2	1	BOOL	**Success Flag** TRUE in case of a successful response, FALSE in case of error.

3.3. ERROR CODES

The full list of error codes can be found in the file *include/c3bi.h*.

Code	Name	Description
0	ErrorGeneral	Unspecified error. In some cases it may be the result of an **E_FAIL** error from the Windows COM subsystem.
1	ErrorSuccess	Not an error. The operation was successful.

2	ErrorAccess	General access denied error. COM equivalent: **E_ACCESSDENIED**.
3	ErrorArgument	One or more arguments are not valid. COM equivalent: **E_INVALIDARG**.
4	ErrorMemory	Failed to allocate necessary memory. COM equivalent: **E_OUTOFMEMORY**.
5	ErrorPointer	**NULL** was passed incorrectly for a pointer value. COM equivalent: **E_POINTER**.
6	ErrorUnexpected	Unexpected failure. COM equivalent: **E_UNEXPECTED**.
7	ErrorNotImplemented	The requested function has not been implemented. In some cases it may be the result of an **E_NOTIMPL** error from the Windows COM subsystem.
8	ErrorNoInterface	No such interface supported. COM equivalent: **E_NOINTERFACE**.
9	ErrorProtocol	Error in message content, incorrect number of fields, or their values.
10	ErrorLongAnswer	The response message is too big. The data cannot fit into a single message.

3.4. MESSAGE TYPES

The full list of message types can be found in the file *include/c3bi.h*.

Type	Name
0	CommandReadVariableAscii
1	CommandWriteVariableAscii
2	CommandReadArrayAscii
3	CommandWriteArrayAscii

4	CommandReadVariable
5	CommandWriteVariable
6	CommandReadMultiple
7	CommandWriteMultiple
8	Reserved
9	
10	CommandProgramControl
11	CommandMotion
12	CommandKcpAction
13	CommandProxyInfo
14	CommandProxyFeatures
15	CommandProxyInfoEx
16	CommandProxyCrossInfo
17	CommandProxyBenchmark
18	Reserved
19	
20	CommandFileSetAttribute
21	CommandFileNameList
22	CommandFileCreate
23	CommandFileDelete
24	CommandFileCopy
25	CommandFileMove
26	CommandFileGetProperties
27	CommandFileGetFullName
28	CommandFileGetKrcName
29	CommandFileWriteContent
30	CommandFileReadContent

31	
...	Reserved
49	
50	CommandCrossSetInfoOn
51	CommandCrossSetInfoOff
52	CommandCrossGetRobotDirectory
53	CommandCrossDownloadDiskToRobot
54	CommandCrossDownloadMemToRobot
55	CommandCrossUploadFromRobotToDisk
56	CommandCrossUploadFromRobotToMem
57	CommandCrossDeleteRobotProgram
58	CommandCrossRobotLevelStop
59	CommandCrossControlLevelStop
60	CommandCrossRunControlLevel
61	CommandCrossSelectModul
62	CommandCrossCancelModul
63	CommandCrossConfirmAll
64	CommandCrossKrcOk
65	CommandCrossIoRestart
66	
67	
68	CommandCrossReserved
69	
70	
...	Reserved
128	
129	Free Range

...	
254	
255	CommandExtended

3.5. MESSAGES FOR VARIABLE HANDLING

3.5.1. MESSAGE #0. READ VARIABLE (ASCII)

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: Yes

PURPOSE

Retrieving the value of KRL variable or internal variable (ASCII version).

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 0
P A Y L O A D	5	2	UINT16	**LVN** Length of Variable Name
	7	LVN	STRING	Variable Name

RESPONSE

Offset	Size	Type	Meaning

	(bytes)	(bytes)		
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 0
P A Y L O A D	5	2	UINT16	**LVV** Length of Variable Value
	7	LVV	STRING	Variable Value
F O O T E R	variable	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	01	00	00	0E	00	00	0B	24	41	43	43	55	5F	53	54	41
00010	54	45														

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	256
	2	2	UINT16	14
	4	1	UINT8	0

	Offset (bytes)	Size (bytes)	Type	Value
P A Y L O A D	5	2	UINT16	11
	7	11	STRING	$ACCU_STATE

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	01	00	00	10	00	00	0A	23	43	48	41	52	47	45	5F	4F
00010	4B	00	01	01												

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	256
	2	2	UINT16	16
	4	1	UINT8	0
P A Y L O A D	5	2	UINT16	10
	7	10	STRING	#CHARGE_OK
F O O T E R	17	2	UINT16	1
	19	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess

INTERNAL VARIABLES

C3 Bridge Interface contains several internal variables whose values can be obtained with the Read Variable message. Access to the internal variable is possible provided that there is no variable with the same name in the KRL system.

Variable Name	Variable Value
PING	PONG
@PROXY_TYPE	C3 BRIDGE INTERFACE
@PROXY_VERSION	Look at section 2.3. PROXY VERSION REQUEST
@PROXY_FEATURES	Look at section 2.4. PROXY FEATURES REQUEST
@PROXY_HOSTNAME	Look at section 2.5. COMPUTER NAME REQUEST
@PROXY_TIME	Look at section 2.6. DATE AND TIME REQUEST
@PROXY_ADDRESS	Look at section 2.7. PROXY LISTENING ADDRESS REQUEST
@PROXY_PORT	Look at section 2.8. PROXY LISTENING PORT REQUEST
@PROXY_ENABLED	Look at section 2.9. PROXY ENABLED REQUEST

NOTES

- The PING variable is also supported by KukavarProxy.

3.5.2. MESSAGE #1. WRITE VARIABLE (ASCII)

Minimum supported version: 1.0.0 (Open Source)

Support in KukavarProxy: Yes

PURPOSE

Writing the new value of the KRL variable (ASCII version).

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 1
P **A** **Y** **L** **O** **A** **D**	5	2	UINT16	**LVN** Length of Variable Name
	7	LVN	STRING	Variable Name
	variable	2	UINT16	**LVV** Length of Variable Value
	variable	LVV	STRING	Variable Value

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 1
P **A** **Y** **L** **O** **A** **D**	5	2	UINT16	**LVV** Length of Variable Value
	7	LVV	STRING	Variable Value

F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	01	00	00	0E	01	00	07	24	4F	56	5F	50	52	4F	00	02
00010	33	35														

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	256
	2	2	UINT16	14
	4	1	UINT8	1
P A Y L O A D	5	2	UINT16	7
	7	7	STRING	$OV_PRO
	14	2	UINT16	2
	16	2	STRING	35

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	01	00	00	08	01	00	02	33	35	00	01	01				

	Offset (bytes)	Size (bytes)	Type	Value

H **E** **A** **D** **E** **R**	0	2	UINT16	256
	2	2	UINT16	8
	4	1	UINT8	1
P **A** **Y** **L** **O** **A** **D**	5	2	UINT16	2
	7	2	STRING	35
F **O** **O** **T** **E** **R**	9	2	UINT16	1
	11	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess

3.5.3. MESSAGE #2. READ ARRAY (ASCII)

Minimum supported version: None
Support in KukavarProxy: Yes

PURPOSE

(*Translated from KukavarProxy source code*)
Reading and formatting an array variable for the PLC.

3.5.4. MESSAGE #3. WRITE ARRAY (ASCII)

Minimum supported version: None
Support in KukavarProxy: Yes

PURPOSE

(*Translated from KukavarProxy source code*)
Writing an array variable to the PLC.

3.5.5. MESSAGE #4. READ VARIABLE

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Retrieving the value of KRL variable or internal variable.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 4
P A Y L O A D	5	2	UINT16	**LVN** Length of Variable Name (in characters)
	7	LVN × 2	WSTRING	Variable Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 4
P A Y L O A D	5	2	UINT16	**LVV** Length of Variable Value (in characters)
	7	LVV × 2	WSTRING	Variable Value
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	02	00	00	15	04	00	09	24	00	41	00	43	00	54	00	5F
00010	00	42	00	41	00	53	00	45	00							

	Offset (bytes)	Size (bytes)	Type	Value
H E A D	0	2	UINT16	512
	2	2	UINT16	21

	Offset (bytes)	Size (bytes)	Type	Value
E R	4	1	UINT8	4
P A Y L O A D	5	2	UINT16	9
	7	18	WSTRING	$ACT_BASE

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	02	00	00	08	04	00	01	31	00	00	01	01				

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	512
	2	2	UINT16	8
	4	1	UINT8	4
P A Y L O A D	5	2	UINT16	1
	7	2	WSTRING	1
F O O T E R	9	2	UINT16	1
	11	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

INTERNAL VARIABLES

Look at section 3.5.1. MESSAGE #0. READ VARIABLE (ASCII).

3.5.6. MESSAGE #5. WRITE VARIABLE

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Writing the new value of the KRL variable.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 5

	Offset (bytes)	Size (bytes)	Type	Meaning
P A Y L O A D	5	2	UINT16	**LVN** Length of Variable Name (in characters)
	7	LVN × 2	WSTRING	Variable Name
	variable	2	UINT16	**LVV** Length of Variable Value (in characters)
	variable	LVV × 2	WSTRING	Variable Value

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 5
P A Y L O A D	5	2	UINT16	**LVV** Length of Variable Value (in characters)
	7	LVV × 2	WSTRING	Variable Value
F O O T E R	variable	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

| 00000 | 01 | 00 | 00 | 15 | 05 | 00 | 07 | 24 | 00 | 4F | 00 | 56 | 00 | 5F | 00 | 50 |
| 00010 | 00 | 52 | 00 | 4F | 00 | 00 | 01 | 35 | 00 | | | | | | | |

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	256
	2	2	UINT16	21
	4	1	UINT8	5
P A Y L O A D	5	2	UINT16	7
	7	14	WSTRING	$OV_PRO
	21	2	UINT16	1
	23	2	WSTRING	5

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	01	00	00	08	05	00	01	35	00	00	01	01				

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	256
	2	2	UINT16	8
	4	1	UINT8	5
P A Y	5	2	UINT16	1

	Offset	Size	Type	Meaning
L O A D	7	2	WSTRING	5
F O O T E R	9	2	UINT16	1
	11	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.5.7. MESSAGE #6. READ MULTIPLE VARIABLES

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

WARNING

Do not use this function with the C3 Bridge Interface server versions lower than 1.2.0 (Open Source).
Earlier implementations did not work correctly.

PURPOSE

Retrieving the values of several KRL variables or internal variables.

REQUEST

Offset (bytes)	Size (bytes)	Type	Meaning

	Offset	Size	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 6
P A Y L O A D	5	1	UINT8	Number of Variables Value: 0-255
	OPTIONAL			
	6	2	UINT16	**LVN1** Length of Variable 1 (in characters)
	8	LVN1 × 2	WSTRING	Variable 1
	...			
	variable	2	UINT16	**LVNL** Length of Last Variable (in characters)
	variable	LVNL × 2	WSTRING	Last Variable

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 6
P A Y L O	5	1	UINT8	Number of Variables
	6	1	UINT8	**CODE1** Error code of Variable 1 request (look at section <u>3.3. ERROR CODES</u>)

	Offset	Size	Type	Description
A D	7	2	UINT16	**LVV1** Length of Variable 1 Value (in characters)
	9	LVV1 × 2	WSTRING	Variable 1 Value
			...	
	variable	1	UINT8	**CODEL** Error code of Last Variable request (look at section [3.3. ERROR CODES](#))
	variable	2	UINT16	**LVVL** Length of Last Variable Value (in characters)
	variable	LVVL × 2	WSTRING	Last Variable Value
F O O T E R	variable	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	04	00	00	24	06	02	00	04	50	00	49	00	4E	00	47	00
00010	00	0B	40	00	50	00	52	00	4F	00	58	00	59	00	5F	00
00020	50	00	4F	00	52	00	54	00								

	Offset (bytes)	Size (bytes)	Type	Value
H E A D	0	2	UINT16	1024
	2	2	UINT16	36

	Offset	Size	Type	Value
E	4	1	UINT8	6
R				
P	5	1	UINT8	2
A	6	2	UINT16	4
Y				
L	8	8	WSTRING	PING
O	16	2	UINT16	11
A				
D	18	22	WSTRING	@PROXY_PORT

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	04	00	00	1B	06	02	01	00	04	50	00	4F	00	4E	00	47
00010	00	01	00	04	37	00	30	00	30	00	30	00	00	01	01	

	Offset (bytes)	Size (bytes)	Type	Value
H	0	2	UINT16	1024
E				
A	2	2	UINT16	27
D				
E	4	1	UINT8	6
R				
P	5	1	UINT8	2
A	6	1	UINT8	1
Y	7	2	UINT16	4
L	9	8	WSTRING	PONG
O	17	1	UINT8	1
A	18	2	UINT16	4
D	20	8	WSTRING	7000
F	28	2	UINT16	1
O				

O T E R	30	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol
10	ErrorLongAnswer

INTERNAL VARIABLES

Look at section 3.5.1. MESSAGE #0. READ VARIABLE (ASCII).

3.5.8. MESSAGE #7. WRITE MULTIPLE VARIABLES

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

WARNING

Do not use this function with the C3 Bridge Interface server versions lower than 1.3.0 (Open Source).
Earlier implementations did not work correctly.

PURPOSE

Writing new values of several KRL variables.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H	0	2	UINT16	Tag ID

E A D E R	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 7
P A Y L O A D	5	1	UINT8	Number of Variables Value: 0-255
	OPTIONAL			
	6	2	UINT16	**LVN1** Length of Variable 1 (in characters)
	8	LVN1 × 2	WSTRING	Variable 1
	variable	2	UINT16	**LVV1** Length of Variable 1 Value (in characters)
	variable	LVV1 × 2	WSTRING	Variable 1 Value
	...			
	variable	2	UINT16	**LVNL** Length of Last Variable (in characters)
	variable	LVNL × 2	WSTRING	Last Variable
	variable	2	UINT16	**LVVL** Length of Last Variable Value (in characters)
	variable	LVVL × 2	WSTRING	Last Variable Value

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type

	Offset	Length	Type	Description
R				Value: 7
P A Y L O A D	5	1	UINT8	Number of Variables
	6	1	UINT8	**CODE1** Error code of Variable 1 request (look at section 3.3. ERROR CODES)
	7	2	UINT16	**LVV1** Length of Variable 1 Value (in characters)
	9	LVV1 × 2	WSTRING	Variable 1 Value
			…	
	variable	1	UINT8	**CODEL** Error code of Last Variable request (look at section 3.3. ERROR CODES)
	variable	2	UINT16	**LVVL** Length of Last Variable Value (in characters)
	variable	LVVL × 2	WSTRING	Last Variable Value
F O O T E R	variable	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	04	00	00	30	07	02	00	07	24	00	4F	00	56	00	5F	00
00010	50	00	52	00	4F	00	00	02	33	00	37	00	00	07	24	00
00020	4F	00	56	00	5F	00	4A	00	4F	00	47	00	00	03	31	00
00030	30	00	30	00												

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	1024
	2	2	UINT16	48
	4	1	UINT8	7
P A Y L O A D	5	1	UINT8	2
	6	2	UINT16	7
	8	14	WSTRING	$OV_PRO
	22	2	UINT16	2
	24	4	WSTRING	37
	28	2	UINT16	7
	30	14	WSTRING	$OV_JOG
	44	2	UINT16	3
	46	6	WSTRING	100

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	04	00	00	15	07	02	01	00	02	33	00	37	00	01	00	03
00010	31	00	30	00	30	00	00	01	01							

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	1024
	2	2	UINT16	21
	4	1	UINT8	7

	5	1	UINT8	2
P A Y L O A D	6	1	UINT8	1
	7	2	UINT16	2
	9	4	WSTRING	37
	13	1	UINT8	1
	14	2	UINT16	3
	16	6	WSTRING	100
F O O T E R	22	2	UINT16	1
	24	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol
10	ErrorLongAnswer

3.6. MESSAGES FOR KRL PROGRAM HANDLING

3.6.1. MESSAGE #10. PROGRAM CONTROL (SUBTYPE I)

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE
Reset, start, stop or cancel the KRL program.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 10
P A Y L O A D	5	1	UINT8	Command code: 1 — Reset 2 — Start 3 — Stop 4 — Cancel
	6	2	UINT16	Interpreter Type: 0 — Submit Interpreter 1 — Robot Interpreter

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 10
P A Y L O A D	5	1	UINT8	Command code

	Offset	Size	Type	Value
F O O T E R	6	2	UINT16	Error Code
	8	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	02	8C	00	04	0A	01	00	00								

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	652
	2	2	UINT16	4
	4	1	UINT8	10
P A Y L O A D	5	1	UINT8	1
	6	2	UINT16	0

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	02	8C	00	05	0A	01	00	01	01							

Offset (bytes)	Size (bytes)	Type	Value

H E A D E R	0	2	UINT16	652
	2	2	UINT16	5
	4	1	UINT8	10
P A Y L O A D	5	1	UINT8	1
F O O T E R	6	2	UINT16	1
	8	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.6.2. MESSAGE #10. PROGRAM CONTROL (SUBTYPE II)

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Select or run the KRL program.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 10
P A Y L O A D	5	1	UINT8	Command code: 5 — Select 6 — Run
	6	2	UINT16	Interpreter Type (NOT USED)
	8	2	UINT16	**LN** Length of Name (in characters)
	10	LN × 2	WSTRING	Name
	variable	2	UINT16	**LP** Length of Parameters (in characters)
	variable	LP × 2	WSTRING	Parameters
	variable	1	BOOL	Force Select/Run

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 10

P A Y L O A D	5	1	UINT8	Command code
F O O T E R	6	2	UINT16	Error Code
	8	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.7. MESSAGES FOR MANUAL ROBOT CONTROL

3.7.1. MESSAGE #11. MOTION CONTROL

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Initiate a movement of type PTP, PTP_REL, LIN or LIN_REL.

REQUEST

Offset	Size	Type	Meaning

	(bytes)	(bytes)		
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 11
P A Y L O A D	5	1	UINT8	Motion Type: 1 — PTP 2 — LIN 3 — PTP_REL 4 — LIN_REL
	6	2	UINT16	**LP** Length of Position String (in characters)
	8	LP × 2	WSTRING	Position String

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 11
P A Y L O A D	5	1	UINT8	Motion Type
F O	6	2	UINT16	Error Code

	Offset	Size	Type	Description
O T E R	8	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	80	00	4A	0B	01	00	23	7B	00	50	00	4F	00	53	00
00010	3A	00	20	00	58	00	20	00	30	00	2C	00	20	00	59	00
00020	20	00	30	00	2C	00	20	00	5A	00	20	00	30	00	2C	00
00030	20	00	41	00	20	00	30	00	2C	00	20	00	42	00	20	00
00040	30	00	2C	00	20	00	43	00	20	00	30	00	7D	00		

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	128
	2	2	UINT16	74
	4	1	UINT8	11
P A Y L O A D	5	1	UINT8	1
	6	2	UINT16	35
	8	70	WSTRING	{POS: X 0, Y 0, Z 0, A 0, B 0, C 0}

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	80	00	05	0B	01	00	01	01							

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	128
	2	2	UINT16	5
	4	1	UINT8	11
P A Y L O A D	5	1	UINT8	1
F O O T E R	6	2	UINT16	1
	8	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.7.2. MESSAGE #12. KCP KEY EMULATION

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Emulation of button pushing on the KCP device.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 12
P A Y L O A D	5	1	UINT8	Key Type: 1 — Start Key 2 — Stop Key 3 — Jog Key 4 — 6D Space Mouse
	6	4	INT32	Interpreter Type: 0 — Submit Interpreter 1 — Robot Interpreter *or* Axis Number
	10	4	INT32	Key Code
	14	1	BOOL	Direction
	15	1	BOOL	Key Status: TRUE — Released FALSE — Pressed

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H	0	2	UINT16	Tag ID

E A D E R	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 12
P A Y L O A D	5	1	UINT8	Key Type
F O O T E R	6	2	UINT16	Error Code
	8	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.8. SERVICE MESSAGES

3.8.1. MESSAGE #13. GET PROXY INFORMATION

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Request information about the C3 Bridge Interface Server.

REQUEST

<table>
<tr><td></td><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
<tr><td rowspan="3">H E A D E R</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type
Value: 13</td></tr>
<tr><td>P A Y L O A D</td><td colspan="4" align="center">NO PAYLOAD</td></tr>
</table>

RESPONSE

<table>
<tr><td></td><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
<tr><td rowspan="3">H E A D E R</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type
Value: 13</td></tr>
<tr><td rowspan="3">P A Y L O</td><td>5</td><td>1</td><td>UINT8</td><td>Version Major Number</td></tr>
<tr><td>6</td><td>1</td><td>UINT8</td><td>Version Minor Number</td></tr>
<tr><td>7</td><td>1</td><td>UINT8</td><td>Version Type
(look at section <u>1.1. SOFTWARE VERSIONING</u>)</td></tr>
</table>

	Offset	Size	Type	Description
A D O O R	8	2	UINT16	Current Year
	10	2	UINT16	Current Month
	12	2	UINT16	Current Day of Week
	14	2	UINT16	Current Day
	16	2	UINT16	Current Hour (UTC)
	18	2	UINT16	Current Minute (UTC)
	20	2	UINT16	Current Second (UTC)
	22	2	UINT16	Current Millisecond
	24	2	UINT16	**LCN** Length of Computer Name (in characters)
	26	LCN × 2	WSTRING	Computer Name
F O O T E R	variable	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	00	00	01	0D											

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	0
	2	2	UINT16	1
	4	1	UINT8	13

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	00	00	2F	0D	01	00	00	07	E4	00	08	00	02	00	04
00010	00	08	00	38	00	06	03	79	00	0B	56	00	44	00	4D	00
00020	48	00	4F	00	53	00	54	00	54	00	45	00	53	00	54	00
00030	00	01	01													

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	0
	2	2	UINT16	47
	4	1	UINT8	13
P A Y L O A D	5	1	UINT8	1
	6	1	UINT8	0
	7	1	UINT8	0
	8	2	UINT16	2020
	10	2	UINT16	8
	12	2	UINT16	2
	14	2	UINT16	4
	16	2	UINT16	8
	18	2	UINT16	56
	20	2	UINT16	6
	22	2	UINT16	889
	24	2	UINT16	11
	26	22	WSTRING	VDMHOSTTEST
F O	48	2	UINT16	1

O T E R	50	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
1	ErrorSuccess

3.8.2. MESSAGE #14. GET PROXY FEATURES

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Request the list of supported messages for the primary protocol of the C3
Bridge Interface Server.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 14
P A Y L O A D				**NO PAYLOAD**

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 14
P A Y L O A D	5	1	UINT8	Bit field of available messages: from 255 to 248
	6	1	UINT8	Bit field of available messages: from 247 to 240
	7	1	UINT8	Bit field of available messages: from 239 to 232
	8	1	UINT8	Bit field of available messages: from 231 to 224
	9	1	UINT8	Bit field of available messages: from 223 to 216
	10	1	UINT8	Bit field of available messages: from 215 to 208
	11	1	UINT8	Bit field of available messages: from 207 to 200
	12	1	UINT8	Bit field of available messages: from 199 to 192
	13	1	UINT8	Bit field of available messages: from 191 to 184
	14	1	UINT8	Bit field of available messages: from 183 to 176
	15	1	UINT8	Bit field of available messages: from 175 to 168

16	1	UINT8	Bit field of available messages: from 167 to 160
17	1	UINT8	Bit field of available messages: from 159 to 152
18	1	UINT8	Bit field of available messages: from 151 to 144
19	1	UINT8	Bit field of available messages: from 143 to 136
20	1	UINT8	Bit field of available messages: from 135 to 128
21	1	UINT8	Bit field of available messages: from 127 to 120
22	1	UINT8	Bit field of available messages: from 119 to 112
23	1	UINT8	Bit field of available messages: from 111 to 104
24	1	UINT8	Bit field of available messages: from 103 to 96
25	1	UINT8	Bit field of available messages: from 95 to 88
26	1	UINT8	Bit field of available messages: from 87 to 80
27	1	UINT8	Bit field of available messages: from 79 to 72
28	1	UINT8	Bit field of available messages: from 71 to 64
29	1	UINT8	Bit field of available messages: from 63 to 56
30	1	UINT8	Bit field of available messages: from 55 to 48
31	1	UINT8	Bit field of available messages: from 47 to 40

	Offset	Size	Type	Description
	32	1	UINT8	Bit field of available messages: from 39 to 32
	33	1	UINT8	Bit field of available messages: from 31 to 24
	34	1	UINT8	Bit field of available messages: from 23 to 16
	35	1	UINT8	Bit field of available messages: from 15 to 8
	36	1	UINT8	Bit field of available messages: from 7 to 0
FOOTER	37	2	UINT16	Error Code
	39	1	BOOL	Success Flag

SAMPLE REQUEST

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	00	00	01	0E											

	Offset (bytes)	Size (bytes)	Type	Value
HEADER	0	2	UINT16	0
	2	2	UINT16	1
	4	1	UINT8	14

SAMPLE RESPONSE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00000	00	00	00	24	0E	00	00	00	00	00	00	00	00	00	00	00

00010	00	00	00	00	00	00	00	00	00	00	00	00	00	80	00	00
00020	00	00	00	7C	F3	00	01	01								

	Offset (bytes)	Size (bytes)	Type	Value
H E A D E R	0	2	UINT16	0
	2	2	UINT16	36
	4	1	UINT8	14
P A Y L O A D	5	1	UINT8	0
	6	1	UINT8	0
	7	1	UINT8	0
	8	1	UINT8	0
	9	1	UINT8	0
	10	1	UINT8	0
	11	1	UINT8	0
	12	1	UINT8	0
	13	1	UINT8	0
	14	1	UINT8	0
	15	1	UINT8	0
	16	1	UINT8	0
	17	1	UINT8	0
	18	1	UINT8	0
	19	1	UINT8	0
	20	1	UINT8	0
	21	1	UINT8	0
	22	1	UINT8	0

	23	1	UINT8	0
	24	1	UINT8	0
	25	1	UINT8	0
	26	1	UINT8	0
	27	1	UINT8	0
	28	1	UINT8	0
	29	1	UINT8	128
	30	1	UINT8	0
	31	1	UINT8	0
	32	1	UINT8	0
	33	1	UINT8	0
	34	1	UINT8	0
	35	1	UINT8	124
	36	1	UINT8	243
F O O T E R	37	2	UINT16	1
	39	1	BOOL	TRUE

POSSIBLE ERROR CODES

Code	Name
1	ErrorSuccess

3.8.3. MESSAGE #15. GET PROXY INFORMATION (EXTENDED)

Minimum supported version: None
Support in KukavarProxy: No

This feature has not yet been implemented; the section is reserved for future use.

3.8.4. MESSAGE #16. GET CROSS3 INFORMATION

Minimum supported version: None
Support in KukavarProxy: No

This feature has not yet been implemented; the section is reserved for future use.

3.8.5. MESSAGE #17. PERFORM PROXY BENCHMARK

Minimum supported version: 1.2.0 (Open Source)
Support in KukavarProxy: No

PURPOSE
Calculation of execution time for multiple read or write operations of KRL variables.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 17
P **A** **Y** **L**	5	1	BOOL	**WRITE** Type of Operation: FALSE — Read TRUE — Write

	6	1	UINT8	Count of Variables Value: 0-255
	7	4	UINT32	Number of Iterations Value: 0-4294967294
	OPTIONAL			
	11	2	UINT16	**LVN1** Length of Variable 1 (in characters)
	13	LVN1 × 2	WSTRING	Variable 1
	variable	2	UINT16	**LVV1** ONLY WHEN **WRITE** is **TRUE** Length of Variable 1 Value (in characters)
O A D	*variable*	LVV1 × 2	WSTRING	ONLY WHEN **WRITE** is **TRUE** Variable 1 Value
	…			
	variable	2	UINT16	**LVNL** Length of Last Variable (in characters)
	variable	LVNL × 2	WSTRING	Last Variable
	variable	2	UINT16	**LVVL** ONLY WHEN **WRITE** is **TRUE** Length of Last Variable Value (in characters)
	variable	LVVL × 2	WSTRING	ONLY WHEN **WRITE** is **TRUE** Last Variable Value

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length

D E R	4	1	UINT8	Message Type Value: 17
P A Y L O A D	5	1	BOOL	**WRITE** Type of Operation: FALSE — Read TRUE — Write
	6	1	UINT8	Count of Variables
	7	4	UINT32	Number of Iterations
	11	4	UINT32	Start Time (ms)
	15	4	UINT32	Stop Time (ms)
	19	4	UINT32	Time Difference (ms)
F O O T E R	23	2	UINT16	Error Code
	25	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
1	ErrorSuccess
9	ErrorProtocol

3.9. MESSAGES FOR FILE SYSTEM OPERATIONS

3.9.1. CONSTANT VALUES

This section lists the basic constants used in file system operations.

3.9.1.1. Item Attributes

Value	Name
0	None
1	Read Only
2	Hidden
4	System
16	Directory
32	Archive
16 384	Encrypted
268 435 456	Signed

3.9.1.2. Item Types

Value	Name
0	Unknown
1	Directory
2	Virtual Directory
4	Archive
8	Binary File
16	Text File
32	Module
64	Raw
128	Motion File
256	Protected File Container

3.9.1.3. Item List Flags

Value	Name
0	None
1	Recursive
2	Expand

4	Long
8	Old Long
16	No PFC
32	PFC as File
64	ZIP as File

3.9.1.4. Module Parts

Value	Name
0	Unknown
1	SUB
2	SRC
4	DAT
5	SUBDAT
6	SRCDAT
8	Template
16	Motion

3.9.1.5. Copy Flags

Value	Name
0	None
1	Archive
3	Modify
4	Continue
8	Recursive
16	Refresh
48	Update
64	Overwrite Exists
128	No Directory Entries

256	Junk Directory
512	Force Binary
1024	Force Text
2048	No Version Check
4096	Overwrite Read
8192	No KRL Analysis

3.9.1.6. Item Property Flags

Value	Name
0	None
1	Type
2	Name
4	Size
8	Attributes
16	Creation Time
32	Access Time
64	Modified Time
128	Edit Mode
255	All

3.9.1.7. Edit Modes

Value	Name
-1	Unknown
0	Full Edit
1	DatKor
2	ProKor
3	Read Only

3.9.1.8. File IO Operations

Value	Name
0	None
1	Begin Operation
2	Data Transfer
3	Get Data Size
4	End Operation
5	Get Data Checksum

3.9.1.9. Volume Types

Value	Name
0	Unknown
1	KRC Root
2	Removable Device
3	Fixed Device
4	CD-ROM Drive
5	Network Drive
6	RAM Disk
7	Archive Root

3.9.2. MESSAGE #20. SET FILE ATTRIBUTES

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
Changes file attributes.

REQUEST

Offset (bytes)	Size (bytes)	Type	Meaning

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 20
P A Y L O A D	5	4	INT32	Attributes 3.9.1.1. Item Attributes
	9	4	INT32	Mask 3.9.1.1. Item Attributes
	13	2	UINT16	**LN** Length of Name (in characters)
	15	LN × 2	WSTRING	Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 20
P A Y L O A D				**NO PAYLOAD**
F O O T E	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

R			

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.3. MESSAGE #21. LIST DIRECTORY CONTENTS

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
Get a list of files and subdirectories in a directory.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 21
P **A** **Y** **L** **O** **A**	5	4	INT32	Item Type 3.9.1.2. Item Types
	9	4	INT32	Flags 3.9.1.3. Item List Flags
	13	2	UINT16	**LP** Length of Path (in characters)

	Offset (bytes)	Size (bytes)	Type	Meaning
D	15	LP × 2	WSTRING	Path

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 21
P A Y L O A D	5	2	UINT16	Count of Items
	7	2	UINT16	**IL1** Length of First Item
	9	IL1 × 2	WSTRING	First Item
	...			
	variable	2	UINT16	**ILL** Length of Last Item
	variable	ILL × 2	WSTRING	Last Item
	variable	2	UINT16	Count of Item Infos
	variable	2	UINT16	**IIL1** Length of First Item Info
	variable	IIL1 × 2	WSTRING	First Item Info
	...			
	variable	2	UINT16	**IILL** Length of Last Item Info
	variable	IILL × 2	WSTRING	Last Item Info
F O O T E	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

R				

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol
10	ErrorLongAnswer

3.9.4. MESSAGE #22. CREATE NEW FILE

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

Create a new text file, binary file or KRL module.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 22
P **A** **Y** **L** **O**	5	2	UINT16	Item Type 3.9.1.2. Item Types
	7	1	UINT8	Module Part 3.9.1.4. Module Parts
	8	1	BOOL	Always Create

A D D	9	2	UINT16	**LN** Length of Name (in characters)
	11	LN × 2	WSTRING	Name
	variable	2	UINT16	**LTP** Length of Template (in characters)
	variable	LTP × 2	WSTRING	Template

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 22
P A Y L O A D			**NO PAYLOAD**	
F O O T E R	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral

1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.5. MESSAGE #23. DELETE FILE

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
Delete a file.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 23
P A Y L O A D	5	1	BOOL	Always Delete
	6	2	UINT16	**LN** Length of Name (in characters)
	8	LN × 2	WSTRING	Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H	0	2	UINT16	Tag ID

H E A D E R	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 23
P A Y L O A D			**NO PAYLOAD**	
F O O T E R	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.6. MESSAGE #24. COPY FILE

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

Copy a file to another location.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 24
P A Y L O A D	5	4	INT32	Flags 3.9.1.5. Copy Flags
	9	2	UINT16	**LS** Length of Source (in characters)
	11	LS × 2	WSTRING	Source
	variable	2	UINT16	**LD** Length of Destination (in characters)
	variable	LD × 2	WSTRING	Destination

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 24
P A Y L O			**NO PAYLOAD**	

	Offset	Size	Type	Meaning
A D				
F O O T E R	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.7. MESSAGE #25. MOVE FILE

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
Move a file to another location.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 25

P A Y L O A D	5	4	INT32	Flags [3.9.1.5. Copy Flags](#)
	9	2	UINT16	**LS** Length of Source (in characters)
	11	LS × 2	WSTRING	Source
	variable	2	UINT16	**LD** Length of Destination (in characters)
	variable	LD × 2	WSTRING	Destination

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 25
P A Y L O A D			**NO PAYLOAD**	
F O O T E R	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.8. MESSAGE #26. GET FILE PROPERTIES

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
Getting a file's type, attributes, size and time.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 26
P A Y L O A D	5	4	INT32	Flags 3.9.1.6. Item Property Flags
	9	2	UINT16	**LN** Length of Name (in characters)
	11	LN × 2	WSTRING	Name

RESPONSE

Offset	Size	Type	Meaning

	(bytes)	(bytes)		
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 26
P A Y L O A D	5	4	INT32	Item Type 3.9.1.2. Item Types
	9	4	INT32	Item Size (Low Part)
	13	4	INT32	Item Size (High Part)
	17	4	INT32	Attributes 3.9.1.1. Item Attributes
	21	4	INT32	Creation Time (Low Part) A Windows file creation time expressed in ticks
	25	4	INT32	Creation Time (High Part)
	29	4	INT32	Creation Time Bias (minutes)
	33	4	INT32	Access Time (Low Part) A Windows file last access time expressed in ticks
	37	4	INT32	Access Time (High Part)
	41	4	INT32	Access Time Bias (minutes)
	45	4	INT32	Modified Time (Low Part) A Windows file last modification time expressed in ticks
	49	4	INT32	Modified Time (High Part)
	53	4	INT32	Modified Time Bias (minutes)
	57	4	INT32	Edit Mode 3.9.1.7. Edit Modes
	61	2	UINT16	**LN** Length of Item Name (in

				characters)
	63	LN × 2	WSTRING	Item Name
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.9.9. MESSAGE #27. GET FILE FULL PATH

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

Getting the full path to a file.
For example, the path "*/R1/TEST.SRC*" will be converted to "*KRC: \R1\PROGRAM\TEST.SRC*".

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length

	Offset (bytes)	Size (bytes)	Type	Meaning
D E R	4	1	UINT8	Message Type Value: 27
P A Y L O A D	5	2	UINT16	**LP** Length of File Path (in characters)
	7	LP × 2	WSTRING	File Path

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 27
P A Y L O A D	5	2	UINT16	**LP** Length of Output Path (in characters)
	7	LP × 2	WSTRING	Output Path
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.9.10. MESSAGE #28. GET KRC PATH

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

Getting the KRC path to a file.

For example, the path "*KRC:\R1\PROGRAM\TEST.SRC*" will be converted to "*/R1/TEST.SRC*".

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 28
P A Y L O A D	5	2	UINT16	**LP** Length of File Path (in characters)
	7	LP × 2	WSTRING	File Path

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 28
P A Y L O A D	5	2	UINT16	**LP** Length of Output Path (in characters)
	7	LP × 2	WSTRING	Output Path
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.9.11. MESSAGE #29. WRITE FILE CONTENT (BEGINNING)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

FileIoBegin: Creates a new buffer of a given size for further data writing to it. Any previously created buffer is destroyed along with the data.

FileIoGetSize: Specifies the size of a previously allocated buffer, or 0 if no buffer exists.

REQUEST

<table>
<thead>
<tr><th></th><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
</thead>
<tbody>
<tr><td rowspan="3">H E A D E R</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type
Value: 29</td></tr>
<tr><td rowspan="2">P A Y L O A D</td><td>5</td><td>1</td><td>UINT8</td><td>**OPERATION**
3.9.1.8. File IO Operations
1 — FileIoBegin
3 — FileIoGetSize</td></tr>
<tr><td>6</td><td>4</td><td>UINT32</td><td>ONLY WHEN **OPERATION** is **1**
Total Size (in bytes)</td></tr>
</tbody>
</table>

RESPONSE

<table>
<thead>
<tr><th></th><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
</thead>
<tbody>
<tr><td rowspan="3">H E A D E R</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type
Value: 29</td></tr>
<tr><td>P A Y</td><td>5</td><td>1</td><td>UINT8</td><td>Operation</td></tr>
</tbody>
</table>

	Offset	Size	Type	Meaning
L O A D	6	4	UINT32	Buffer Size
F O O T E R	10	2	UINT16	Error Code
	12	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.12. MESSAGE #29. WRITE FILE CONTENT (DATA CHUNK)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

FileIoData: Writes a chunk of data of a certain size to the buffer at the specified offset.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length

	Offset	Size	Type	Meaning
D E R	4	1	UINT8	Message Type Value: 29
P A Y L O A D	5	1	UINT8	**OPERATION** 3.9.1.8. File IO Operations 2 — FileIoData
	6	4	UINT32	Offset (in bytes)
	10	4	UINT32	**SIZE** Chunk Size (in bytes)
	14	SIZE	BINARY	Chunk Data

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 29
P A Y L O A D	5	1	UINT8	Operation Value: 2
	6	4	UINT32	Offset (in bytes)
	10	4	UINT32	Size of Bytes Written
F O O T E R	14	2	UINT16	Error Code
	16	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.13. MESSAGE #29. WRITE FILE CONTENT (CHECKSUM)

Minimum supported version: None
Support in KukavarProxy: No

This feature has not yet been implemented; the section is reserved for future use.

3.9.14. MESSAGE #29. WRITE FILE CONTENT (FINAL)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE
FileIoEnd: Writes the contents of the buffer to a file on disk.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 29

	Offset (bytes)	Size (bytes)	Type	Meaning
P A Y L O A D	5	1	UINT8	**OPERATION** 3.9.1.8. File IO Operations 4 — FileIoEnd
	6	4	INT32	Flags 3.9.1.5. Copy Flags
	10	2	UINT16	**LN** Length of File Name (in characters)
	12	LN × 2	WSTRING	File Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 29
P A Y L O A D	5	1	UINT8	Operation Value: 4
F O O T E R	6	2	UINT16	Error Code
	8	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name

0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.15. MESSAGE #30. READ FILE CONTENT (BEGINNING)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

FileIoBegin: Transfers the contents of a file on disk to the read buffer and returns its size.
FileIoGetSize: Specifies the size of the read buffer, or 0 if no buffer exists.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 30
P A Y L O A D	5	1	UINT8	**OPERATION** 3.9.1.8. File IO Operations 1 — FileIoBegin 3 — FileIoGetSize
	ONLY WHEN OPERATION is 1			
	6	4	INT32	Flags 3.9.1.5. Copy Flags
	10	4	UINT32	**LN** Flags

	Offset (bytes)	Size (bytes)	Type	Meaning
				Length of File Name (in characters)
	14	LN × 2	WSTRING	File Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
HEADER	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 30
PAYLOAD	5	1	UINT8	Operation
	6	4	UINT32	Buffer Size
FOOTER	10	2	UINT16	Error Code
	12	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.16. MESSAGE #30. READ FILE CONTENT (DATA CHUNK)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

FileIoData: Reads a data fragment of the specified size into the buffer at the specified offset.

REQUEST

<table>
<tr><th></th><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
<tr><td rowspan="3">H E A D E R</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type
Value: 30</td></tr>
<tr><td rowspan="3">P A Y L O A D</td><td>5</td><td>1</td><td>UINT8</td><td>**OPERATION**
3.9.1.8. File IO Operations
2 — FileIoData</td></tr>
<tr><td>6</td><td>4</td><td>UINT32</td><td>Offset (in bytes)</td></tr>
<tr><td>10</td><td>4</td><td>UINT32</td><td>Maximum Chunk Size (in bytes)
This value can be FFFFFFFFh to read the largest amount of data at the time.</td></tr>
</table>

RESPONSE

<table>
<tr><th></th><th>Offset (bytes)</th><th>Size (bytes)</th><th>Type</th><th>Meaning</th></tr>
<tr><td rowspan="3">H E A D E</td><td>0</td><td>2</td><td>UINT16</td><td>Tag ID</td></tr>
<tr><td>2</td><td>2</td><td>UINT16</td><td>Message Length</td></tr>
<tr><td>4</td><td>1</td><td>UINT8</td><td>Message Type</td></tr>
</table>

R				Value: 30
P A Y L O A D	5	1	UINT8	Operation Value: 2
	6	4	UINT32	Offset (in bytes)
	10	4	UINT32	**SIZE** Size of Bytes Read
	14	SIZE	BINARY	Chunk Data
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.17. MESSAGE #30. READ FILE CONTENT (CHECKSUM)

Minimum supported version: None
Support in KukavarProxy: No

This feature has not yet been implemented; the section is reserved for future use.

3.9.18. MESSAGE #30. READ FILE CONTENT (FINAL)

Minimum supported version: 1.1.2 (Freeware)
Support in KukavarProxy: No

PURPOSE

FileIoEnd: Clearing the read buffer and freeing the memory.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 30
P A Y L O A D	5	1	UINT8	**OPERATION** 3.9.1.8. File IO Operations 4 — FileIoEnd

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 30

	Offset (bytes)	Size (bytes)	Type	Meaning
P A Y L O A D	5	1	UINT8	Operation Value: 4
F O O T E R	6	2	UINT16	Error Code
	8	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol

3.9.19. MESSAGE #31. GET VOLUME PROPERTIES

Minimum supported version: 1.7.1 (Proprietary)
Support in KukavarProxy: No

PURPOSE

Get information about the volume type, its name (label) and capacity (amount
of free space, used and total).

REQUEST

Offset (bytes)	Size (bytes)	Type	Meaning

H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 31
P **A** **Y** **L** **O** **A** **D**	5	2	UINT16	**LD** Length of Drive (in characters)
	7	LD × 2	WSTRING	Drive

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H **E** **A** **D** **E** **R**	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 31
P **A** **Y** **L** **O** **A** **D**	5	4	INT32	Volume Type 3.9.1.9. Volume Types
	9	8	UINT64	Total size in bytes
	17	8	UINT64	Free space in bytes
	25	8	UINT64	Used space in bytes
	33	2	UINT16	**LN** Length of Volume Name (in characters)
	35	LN × 2	WSTRING	Volume Name
F **O**	*variable*	2	UINT16	Error Code

O T E R	*variable*	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.9.20. MESSAGE #32. SET VOLUME NAME

Minimum supported version: 1.7.1 (Proprietary)
Support in KukavarProxy: No

PURPOSE
Set a new volume name (label).

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 32
P A Y L O	5	2	UINT16	**LD** Length of Drive (in characters)
	7	LD × 2	WSTRING	Drive
	variable	2	UINT16	**LN** Length of Name (in characters)

A D D	*variable*	LN × 2	WSTRING	Name

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 32
P A Y L O A D			**NO PAYLOAD**	
F O O T E R	5	2	UINT16	Error Code
	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
9	ErrorProtocol

3.9.21. MESSAGE #33. LIST OF AVAILABLE VOLUMES

Minimum supported version: 1.7.1 (Proprietary)
Support in KukavarProxy: No

PURPOSE

Get a list of available volumes.

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 33
P A Y L O A D				**NO PAYLOAD**

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 33
P	5	2	UINT16	Count of Volumes

A Y L O A D	7	2	UINT16	**IL1** Length of First Volume
	9	IL1 × 2	WSTRING	First Volume
			…	
	variable	2	UINT16	**ILL** Length of Last Volume
	variable	ILL × 2	WSTRING	Last Volume
F O O T E R	*variable*	2	UINT16	Error Code
	variable	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess
7	ErrorNotImplemented
9	ErrorProtocol
10	ErrorLongAnswer

3.10. MESSAGES FOR CROSSCOMMEXE COMPATIBILITY

3.10.1. MESSAGE #63. CONFIRM ALL

Minimum supported version: 1.0.0 (Open Source)
Support in KukavarProxy: No

PURPOSE

Reset all errors on the KRC (emulation of pressing the Confirm All button).

REQUEST

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 63
P A Y L O A D				**NO PAYLOAD**

RESPONSE

	Offset (bytes)	Size (bytes)	Type	Meaning
H E A D E R	0	2	UINT16	Tag ID
	2	2	UINT16	Message Length
	4	1	UINT8	Message Type Value: 63
P A Y L O A D				**NO PAYLOAD**
F	5	2	UINT16	Error Code

F O O T E R	7	1	BOOL	Success Flag

POSSIBLE ERROR CODES

Code	Name
0	ErrorGeneral
1	ErrorSuccess