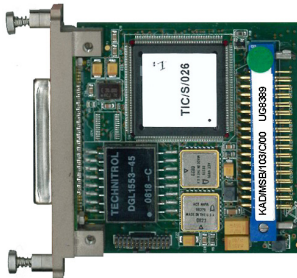


# KAD/MSB/103

MIL-STD-1553 bus monitor parser - 1ch dual redundant

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## Key Features

- Monitors a single direct coupled or transformer coupled dual redundant MIL-STD-1553 bus
- Coherently parses traffic and tags for up to 1,024 messages (including one catchall)
- 3K word deep selective FIFO for traffic and tags (snarfer) formatted with IRIG-106 Ch.8
- Handles all mode codes (including user defined)
- Protocol tracker does not rely on instrumentation bit
- ID based on all 16 bits of command

## Applications

- MIL-STD-1553 traffic monitor

## Overview

The KAD/MSB/103 is a MIL-STD-1553 dual redundant bus monitor which combines the capabilities of a snarfer, coherent message parser, message counter, and error detection functions on a single module. Traffic refers to words on the bus (command, status, and data) and tags refer to associated information (microsecond time of sync. bit transition, message count, response time, and errors). When used in parser mode, the KAD/MSB/103 triple buffers up to 1,023 complete messages and their associated tags in buffers up to 43 words wide. The INFO tag associated with each message has a stale bit (message read before), a skipped bit (buffer overwritten) and an empty bit (message was never received), as well as an indication on which bus the message was received. The MESSAGE count increments on receipt of a valid message. The ERROR word has bits indicating the type of error caught in the form of a 6-bit (up to 38 different errors) code and the bus on which it occurred.

The KAD/MSB/103 records Mode Code 17 for which the ID is based on the last Mode Code 17 sub-address map number received for the involved remote terminals. With that it can monitor the full expanded sub-address space for up to 31 remote terminals. It also has an optional recording of messages with time out status reply. The snarfer stores selected traffic and tags in a FIFO 3K words deep. Each snarfer word has 16 bits for traffic/tag information and 8 bits for FIFO content identification. Data selection and content identification is based on the bus (primary/secondary), traffic type (command, status, data), tag type (high/low/micro/response time, message count) and how full the FIFO is.

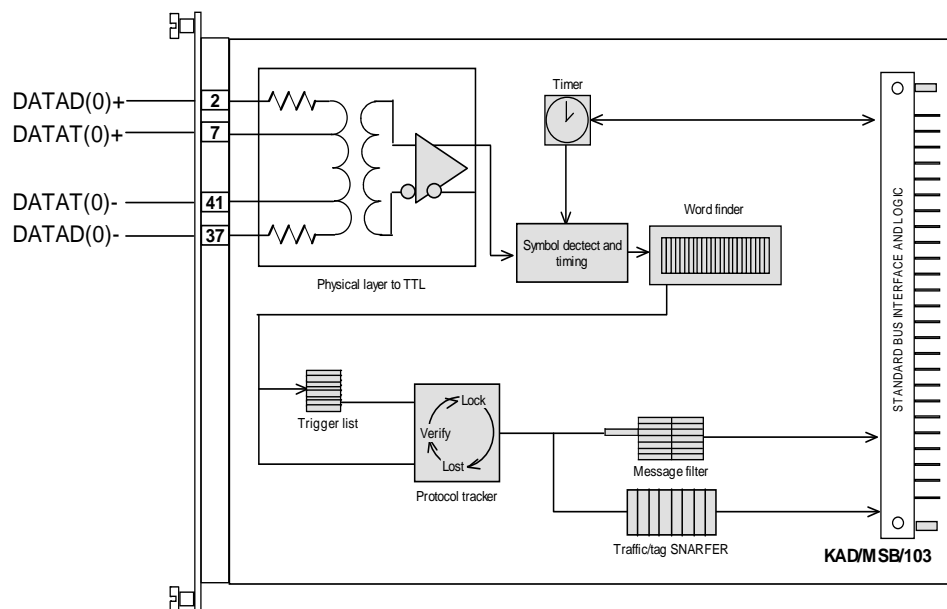


Figure 1: Primary bus monitor on the KAD/MSB/103

## Specifications

All values provided in the following specification tables are valid within the operating temperature range specified under “Environmental ratings” in the “General specifications” table.

TABLE 1		General specifications			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Slots	–	–	1	–	Can be placed in any user-slot in any combination.
Mass					
	–	80	–	g	
	–	2.82	–	oz	Design metric is grams.
Height above chassis					
bare connector	–	–	11	mm	
bare connector	–	–	0.43	in.	Design metric is millimeters.
Access rate	–	–	2	Msps	Maximum combined access rate for read and write.
Power consumption					
+5V	106	–	147	mA	
+7V	0	–	0	mA	
-7V	0	–	0	mA	
+12V	0	–	0	mA	
-12V	0	–	0	mA	
total power	0.530	–	0.735	W	Particular combinations of chassis and Acra KAM-500 modules may have power or current limitations. For details, see <i>TEC/NOT/016 - Power dissipation</i> , <i>TEC/NOT/049 - Power estimation</i> , and the relevant chassis data sheet.
Environmental ratings					See <i>Environmental Qualification Handbook</i> .
operating temperature	-40	–	85	°C	Chassis base/side plate temperature.
storage temperature	-55	–	105	°C	

TABLE 2		MIL-STD-1553			
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	–	–	1	–	Dual redundant. MIL-STD-1553-B compatible.
Sampling rate					
	–	–	2	Msps	Maximum data rate of MIL-STD-1553 is 36kwps.
Operating range					
transformer coupled	1.3	–	20	V <sub>p-p</sub>	
direct coupled	1.8	–	20	V <sub>p-p</sub>	

## Setting up the KAD/MSB/103

All module setup can be defined in XML using XidML® schemas (see <http://www.xidml.org>).

### Instrument settings

SETUP DATA	CHOICE	DEFAULT	NOTES
Manufacturer	-	-	-
Name	ACRA CONTROL	ACRA CONTROL	Name of manufacturer.
PartReference	KAD/MSB/103/C	KAD/MSB/103/C	The instrument part reference.
SerialNumber	FA2342	FA2342	Unique name for each module.
Settings	-	-	-
Fill Value	0000 to FFFF	AAAA	Specifies the value that should be stored when the bus monitor is not receiving data.
Settings Snarfer Filtering	-	-	-
Fifo Level-25	All TrafficOnly HeaderOnly ErrorOnly	All	Specifies the type of data that should be stored when the FIFO is 25% or less full.
Fifo Level-50	All TrafficOnly HeaderOnly ErrorOnly	TrafficOnly	Specifies the type of data that should be stored when the FIFO is 50% or less full.
Fifo Level-75	All TrafficOnly HeaderOnly ErrorOnly	HeaderOnly	Specifies the type of data that should be stored when the FIFO is 75% or less full.
Fifo Level-100	All TrafficOnly HeaderOnly ErrorOnly	ErrorOnly	Specifies the type of data that should be stored when the FIFO is 100% or less full.
Bus ID	0 1 2 3 4 5 6 7	0	-
Processes	-	-	-
Parser(1022:0)	-	-	One of 1023 selective parser slots.
Catchall-Parser	-	-	Any message that is not parsed goes to this final parser slot.
Channels	-	-	-
MIL-STD-1553-In MIL-STD-1553 Input	-	-	Represents a typical MIL-STD-1553 bus monitor channels configuration.
Settings	-	-	-
Maximum Response Time	1 to 31	12	Maximum permitted response time for RT in micro seconds.
Accept Rx Message With No Status	True False	False	Receive messages with no status response is stored, when set to true.
Accept Tx Message With No Status	True False	False	Transmit messages with no status response is stored, when set to true.

SETUP DATA	CHOICE	DEFAULT	NOTES
Settings Mode Code 17	-	-	Mode Code 17 messages are used to extend the Sub Address range for a RT by providing a Sub-sub Addressing
Load Map From	SSA Cycle	SSA	This element is used to specify which bits from the data word of the mode code 17 message are used for the map index. The allowed values are "SSA" and "Cycle"
Time Bit First	True False	False	This element is used to specify if the Time Bit in a mode code 17 message is the least significant bit (true) or the most significant bit (false).
Ignore Fresh Bit	False True	False	This element is used to control updating of the map index depending on the fresh bit value in the mode code 17 data word. A value of "true" means the fresh bit is ignored and a value of "false" means it is not ignored.
Ignore Time Bit	True False	False	This element is used to control updating of the map index depending on the time bit value in the mode code 17 data word. A value of "true" means the time bit is ignored and a value of "false" means it is not ignored.
Default Map On Power Up	00 to 7F	00	This element can be used to specify the default extended sub-address mapping when the bus monitor first powers up. The value expected is a hexadecimal value.

### Parameter definitions

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
Global Parameters				
Report Reports the status of the module	BitVector	BitVector	16	R[15:0] R(15) ErrorSinceLastRead - 1 indicates error occurred since last read. R(14) ErrorOnSecondaryBus - 1 indicates the last error occurred on secondary bus. R[13:6] Reserved - Reserved for future use. R[5:0] ErrorCodes - Indicates the error that occurred last (See "Error codes for the KAD/MSB/103").
Snarfer Content Identifier and Content of 1553 Traffic captured on the MIL-STD-1553 bus.	BitVector	BitVector	32	R[31:0]
SnarferHi Snarfer contents as indicated by content identifier. This and SnarferHi are read from the Snarfer24 FIFO.	BitVector	BitVector	16	R[31:16] R[30:15] Parity - 1 Indicates an even number of ones in the bus identifier, content identifier and content. R[14:12] Bus ID - Bus identifier as defined in setup. R[11:8] Content identifier - (See "Content IDs for KAD/MSB/103 snarfer FIFO") R[7:0] Reserved for future use

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
<b>SnarferLo</b> Bus number and content identifier. This together with SnarferLo is read from the Snarfer24 FIFO.	BitVector	BitVector	16	R[15:0] R[15:0] Content - The contents of the snarfer according to the content identifier COMMAND, STATUS, DATA, TIME_HI, TIME_LO, TIME_MICRO. The contents for snarfer empty are AAAA(hex). The contents for snarfer full are 5555(hex). The contents for NON-DATA are the command/status bits if not enough information is available to distinguish between them (this can only happen when recovering from an error condition). When ERROR: R[15:7] are reserved. R(6) = 1 indicates the error was on the secondary bus. R[5:0] Indicates the error that occurred. (See "Error codes for the KAD/MSB/103").
<b>Snarfer24</b> The parameter is made up from the 16 bits of SnarferLo and the eight bits of data in SnarferHi.	BitVector	BitVector	24	R[23:0] R[23:0] Snarfer24 - The parameter is made up from the 16 bits of SnarferLo and the 8 bits of data in SnarferHi
<b>Parser(1022:0) Parameters</b> <b>MessageCount</b> Message counter value when the word was received.	Count	OffsetBinary	16	R[15:0] R[15:0] MessageCount
<b>MessageCommand1</b> First command word in message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageCommand1
<b>MessageStatus1</b> First status word stored in message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageStatus1
<b>MessageResponseTime1</b> First status word's response time in microseconds.	Second	OffsetBinary	16	R[15:0] R[15:0] MessageResponseTime1
<b>MessageCommand2</b> Second command word of an RT-RT message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageCommand2
<b>MessageStatus2</b> Second status word of an RT-RT message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageStatus2
<b>MessageResponseTime2</b> Second status word's response time in microseconds of an RT-RT message.	Second	OffsetBinary	16	R[15:0] R[15:0] MessageResponseTime2
<b>MessageInfo</b> Stale/skipped indication for this parsed message.	BitVector	BitVector	16	R[15:0] R(15) Empty - 1 indicates this parser slot is empty. R(14) Stale - 1 indicates this message was read before. R(13) Skipped - 1 indicates this message overwrote another. R[12:0] Reserved - Reserved for future use.
<b>MessageIrigTime48</b> 48 bit wide IRIG time word.	BitVector	BitVector	48	R[47:0]

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
<b>MessageTimeHi</b> Hours and minutes time midway through first transmitted bit.	BitVector	BitVector	16	R[47:32] R[15:13] Reserved - Reserved for future use. R[12:7] Hours - BCD Hours 0 to 23. R[6:0] Minutes - BCD Minutes 0 to 59.
<b>MessageTimeLo</b> Seconds and centiseconds time midway through first transmitted bit.	Second	BCD	16	R[31:16] R(15) Reserved - Reserved for future use. R[14:8] Seconds - BCD Seconds 0 to 59. R[7:0] Centiseconds - BCD Centiseconds 0 to 99.
<b>MessageTimeMicro</b> Microsecond time midway through first transmitted bit.	Second	BCD	16	R[15:0] R[15:0] Microseconds - BCD Microseconds 0 to 9999.
<b>Catchall-Parser Parameters</b>				
<b>MessageCount</b> Message counter value when the word was received.	Count	OffsetBinary	16	R[15:0] R[15:0] MessageCount
<b>MessageCommand1</b> First command word in message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageCommand1
<b>MessageStatus1</b> First status word stored in message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageStatus1
<b>MessageResponseTime1</b> First status word's response time in microseconds.	Second	OffsetBinary	16	R[15:0] R[15:0] MessageResponseTime1
<b>MessageData(31:0)</b> MIL-1553 message data	BitVector	BitVector	16	R[15:0] R[15:0] MessageData
<b>MessageCommand2</b> Second command word of an RT-RT message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageCommand2
<b>MessageStatus2</b> Second status word of an RT-RT message.	BitVector	BitVector	16	R[15:0] R[15:0] MessageStatus2
<b>MessageResponseTime2</b> Second status word's response time in microseconds of an RT-RT message.	Second	OffsetBinary	16	R[15:0] R[15:0] MessageResponseTime2
<b>MessageInfo</b> Stale/skipped indication for this parsed message.	BitVector	BitVector	16	R[15:0] R(15) Empty - 1 indicates this parser slot is empty. R(14) Stale - 1 indicates this message was read before. R(13) Skipped - 1 indicates this message overwrote another. R[12:0] Reserved - Reserved for future use.
<b>MessageIrigTime48</b> 48 bit wide IRIG time word	BitVector	BitVector	48	R[47:0]
<b>MessageTimeHi</b> Hours and minutes time midway through first transmitted bit.	BitVector	BitVector	16	R[47:32] R[15:13] Reserved - Reserved for future use. R[12:7] Hours - BCD Hours 0 to 23. R[6:0] Minutes - BCD Minutes 0 to 59.

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
MessageTimeLo Seconds and centiseconds time midway through first transmitted bit.	Second	BCD	16	R[31:16] R(15) Reserved - Reserved for future use. R[14:8] Seconds - BCD Seconds 0 to 59. R[7:0] Centiseconds - BCD Centiseconds 0 to 99.
MessageTimeMicro Microsecond time midway through first transmitted bit.	Second	BCD	16	R[15:0] R[15:0] Microseconds - BCD Microseconds 0 to 9999.
MIL-STD-1553-In Parameters				
MessageCountPrimary Count of all valid messages on the bus.	Count	OffsetBinary	16	R[15:0] R[15:0] MessageCountPrimary
MessageCountSecondary Count of all valid messages on the bus.	Count	OffsetBinary	16	R[15:0] R[15:0] MessageCountSecondary

**NOTE:** It is recommended that names are less than 20 characters, have no white space or contain any of the following five characters "><\.

### Content IDs for KAD/MSB/103 snarfer FIFO

CONTENT ID	DESCRIPTION
0 <sub>16</sub>	Buffer overflow
1 <sub>16</sub>	Fill word (content ID is 1 when the FIFO is empty)
2 <sub>16</sub>	Non-data secondary (in case of error event)
3 <sub>16</sub>	Non-data primary (in case of error event)
4 <sub>16</sub>	Time - Response
5 <sub>16</sub>	Time - Microsecond
6 <sub>16</sub>	Time - Low
7 <sub>16</sub>	Time - High
8 <sub>16</sub>	Error secondary
9 <sub>16</sub>	Data secondary
A <sub>16</sub>	Status secondary
B <sub>16</sub>	Command secondary
C <sub>16</sub>	Error primary
D <sub>16</sub>	Data primary
E <sub>16</sub>	Status primary
F <sub>16</sub>	Command primary

## Error codes for the KAD/MSB/103

ERROR CODE	DESCRIPTION
0 <sub>16</sub>	Reserved for future use.
1 <sub>16</sub>	Data word did not have enough bits.
2 <sub>16</sub>	Data word had bit error.
3 <sub>16</sub>	Data word had parity error.
4 <sub>16</sub>	Non-data word did not have enough bits.
5 <sub>16</sub>	Non-data word had bit error.
6 <sub>16</sub>	Non-data word had parity error.
7 <sub>16</sub>	Reserved for future use.
8 <sub>16</sub>	Expected data word was non-data word.
9 <sub>16</sub>	Expected data word did not have contiguous word.
A <sub>16</sub>	Expected last data word was not last.
B <sub>16</sub>	Expected mode data word was non-data word.
C <sub>16</sub>	Expected mode data word has contiguous traffic.
D <sub>16</sub>	Reserved for future use.
E <sub>16</sub>	Reserved for future use.
F <sub>16</sub>	Reserved for future use.
10 <sub>16</sub>	Expected first cmd. was data word.
11 <sub>16</sub>	Expected first cmd. had invalid RT.
12 <sub>16</sub>	Expected first cmd. had invalid SA.
13 <sub>16</sub>	Expected first cmd. had invalid number of words.
14 <sub>16</sub>	Expected first cmd. was invalid mode.
15 <sub>16</sub>	Expected first cmd. had contiguous traffic.
16 <sub>16</sub>	Expected first cmd. was Rx with no contiguous data word.
17 <sub>16</sub>	Expected first cmd. was Mode with no contiguous data.
18 <sub>16</sub>	Expected second sts. of RT to RT was data word.
19 <sub>16</sub>	Expected second sts. of RT to RT had incorrect RT.
1A <sub>16</sub>	Expected second sts. of RT to RT had contiguous traffic.
1B <sub>16</sub>	Expected second sts. of RT to RT timed out.
1C <sub>16</sub>	Received invalid 2nd status in RT to RT.
1D <sub>16</sub>	Reserved for future use.
1E <sub>16</sub>	Reserved for future use.
1F <sub>16</sub>	Reserved for future use.
20 <sub>16</sub>	Expected sts. was data word.
21 <sub>16</sub>	Expected sts. was invalid.



ERROR CODE	DESCRIPTION
22 <sub>16</sub>	Expected sts. had incorrect RT.
23 <sub>16</sub>	Expected sts. had contiguous traffic.
24 <sub>16</sub>	Expected sts. timed out.
25 <sub>16</sub>	Expected sts. had no contiguous data word.
26 <sub>16</sub>	Reserved for future use.
27 <sub>16</sub>	Reserved for future use.
28 <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had invalid RT.
29 <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had invalid SA.
2A <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had invalid number of words.
2B <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had different number of words than Rx cmd.
2C <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had same RT as Rx cmd.
2D <sub>16</sub>	Expected Tx cmd. of RT to RT(s) had contiguous traffic.
2E <sub>16</sub>	Expected Tx cmd. of RT to RT(s) was not a Tx cmd.
2F <sub>16</sub>	Reserved for future use.
30 <sub>16</sub>	Reserved for future use.
31 <sub>16</sub>	Reserved for future use.
32 <sub>16</sub>	Reserved for future use.
33 <sub>16</sub>	Reserved for future use.
34 <sub>16</sub>	Reserved for future use.
35 <sub>16</sub>	Reserved for future use.
36 <sub>16</sub>	Reserved for future use.
37 <sub>16</sub>	Reserved for future use.
38 <sub>16</sub>	Reserved for future use.
39 <sub>16</sub>	Reserved for future use.
3A <sub>16</sub>	Reserved for future use.
3B <sub>16</sub>	Reserved for future use.
3C <sub>16</sub>	Reserved for future use.
3D <sub>16</sub>	Reserved for future use.
3E <sub>16</sub>	Reserved for future use.
3F <sub>16</sub>	Reset occurred since last read.

Tx = Transmit; sts = status; cmd = command.

## Getting the most from the KAD/MSB/103

The following section describes how to configure the KAD/MSB/103 for specific data acquisition requirements.

### Detecting messages when a remote terminal is off-line

When a MIL-STD-1553 remote terminal is off-line, it does not respond (with a STATUS word) to bus controller Rx commands. When a MIL-STD-1553 remote terminal is off-line, it does not respond (with a STATUS word followed by data) to bus controller Tx commands.

To acquire data from MIL-STD-1553 messages which have been sent from the bus controller to off-line remote terminals, see “Message capture settings” on page 10. To determine, via telemetry, if a remote terminal is off-line, see “Detecting when a Tx remote terminal is off-line” on page 10.

### Message capture settings

The following settings can be used to capture messages when the remote terminal is off-line:

- AcceptRxMessageWithNoStatus
- AcceptTxMessageWithNoStatus

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**NOTE:** The message counter on the KAD/MSB/103 counts all messages that go into the parser, which are defined by either AcceptRxMessageWithNoStatus or AcceptTxMessageWithNoStatus.

#### AcceptRxMessageWithNoStatus

If any remote terminals monitoring the MIL-STD-1553 bus are likely to be off-line, set AcceptRxMessageWithNoStatus to YES. When AcceptRxMessageWithNoStatus is set to YES, the KAD/MSB/103 captures data from Rx command messages, where the remote terminal does not respond with a STATUS word. In this scenario, the STATUS word in the parser is hex FFFF.

If AcceptRxMessageWithNoStatus is set to NO, then only complete messages, where a remote terminal responds, are captured.

#### AcceptTxMessageWithNoStatus

When AcceptTxMessageWithNoStatus is set to YES, the KAD/MSB/103 accepts Tx command messages where the remote terminal does not respond. In this scenario, only the Tx command appears on the MIL-STD-1553 bus, the KAD/MSB/103 parser data is invalid, the STATUS word in the parser is hex FFFF and time stamps record any occurrence of the COMMAND word.

The AcceptTxMessageWithNoStatus setting enables the capture of messages when the remote terminal is off-line. However, for this setting to have an effect, AcceptRxMessageWithNoStatus must be set to YES.

When AcceptTxMessageWithNoStatus is set to NO, the KAD/MSB/103 rejects Tx command messages where the remote terminal does not respond. The effect on the parser is that the last valid message with the last valid data and time stamps remain.

### Detecting when a Tx remote terminal is off-line

To detect when a Tx remote terminal is off-line, set AcceptTxMessageWithNoStatus to YES. The parser STATUS word must be sent to detect this and then be processed in the ground station. If the STATUS word is hex FFFF, the ground station must deal with the invalid data in the parser. Otherwise, the data shows spikes.

### Response time

One feature of the KAD/MSB/103 is the ability to program the response timeout. This value should reflect the actual response timeout on the MIL-STD-1553 bus. Under normal circumstances a remote terminal responds within 4 to 12 microseconds. However a remote terminal should wait a minimum of 14 microseconds before considering that the remote terminal has timed out. Some implementations of MIL-STD-1553 have deviated from the standard and have their own response times. For this reason, the expected response time is configurable on the KAD/MSB/103.

It is important that the KAD/MSB/103 has response time configured correctly because there may be confusion over which MIL-STD-1553 messages certain control words belong to. In MIL-STD-1553, the COMMAND word and STATUS word have the

same signature. For example, if the response time is set too high, and if there is no response from a particular RT, the next COMMAND word may belong to that message as a STATUS word. This may cause issues parsing the next message. If the response time is set too low, then the KAD/MSB/103 may consider that a valid message has timed out due to no response. The status of this message appears as the next command. This may cause issues parsing the next message and so on.

### Parser sample rate

The KAD/MSB/103 parser is triple buffered. If there is a burst of more than three messages between parser sampling intervals, the triple buffer can be saturated. Therefore, if it is necessary that all messages get captured, the parser data must be sampled at the speed of the burst if this is above the aggregate rate.

### Variable sized messages

By default, the KAD/MSB/103 is configured to parse any number of data words for a particular message. It is also possible to parse messages of particular sizes.

In cases where there are variable sized messages and when word count is set to “all”, care must be taken when processing the data. The parser only updates the data words that appear on the MIL-STD-1553 bus. The other words are not valid. This means that the ground station or post processing must use the number of data words indicated in the command word to identify which data words are valid. The other option is to parse particular message sizes individually.

### Snarfer sampling rate

The snarfer sample rate should be set according to the expected aggregate bus traffic. A 100% utilized bus has MIL-STD-1553 traffic appearing at 50kHz. This can be used as a guideline for configuring the snarfer sample rate. For 100% utilization, sample at 50kHz; for 50% utilization, sample at 25kHz and so on. If the FIFO overflows, MIL-STD-1553 traffic is lost. Therefore, it is important to set the snarfer filter settings appropriately.

### Snarfer filtering options

SETTING	DESCRIPTION
All	Traffic + three time tags of command and status + response time
ErrorOnly	Error tags only
TrafficOnly	Traffic as it appears on the bus with any errors flagged and time tagged
HeaderOnly	Command, status, and time tagged errors

## Connector pinout of the KAD/MSB/103

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	DNC		Do not connect
2	DATAD(0)+	MIL-STD-1553	Direct coupled primary bus
3	DNC		Do not connect
4	DNC		Do not connect
5	DNC		Do not connect
6	DNC		Do not connect
7	DATAT(0)+	MIL-STD-1553	Transformer coupled primary bus
8	DNC		Do not connect
9	DNC		Do not connect
10	DNC		Do not connect
11	DNC		Do not connect
12	DATAT(1)+	MIL-STD-1553	Transformer coupled secondary bus
13	DNC		Do not connect
14	DNC		Do not connect
15	DNC		Do not connect
16	DNC		Do not connect
17	DATAD(1)+	MIL-STD-1553	Direct coupled secondary bus
18	DNC		Do not connect
19	DNC		Do not connect
20	DNC		Do not connect
21	DNC		Do not connect
22	GND	KAM-500 internal ground	
23	DNC		Do not connect
24	DNC		Do not connect
25	DNC		Do not connect
26	DNC		Do not connect
27	DNC		Do not connect
28	DNC		Do not connect
29	DNC		Do not connect
30	DNC		Do not connect
31	DNC		Do not connect
32	GND	KAM-500 internal ground	
33	DNC		Do not connect
34	DNC		Do not connect
35	DNC		Do not connect
36	DNC		Do not connect
37	DATAD(0)-	MIL-STD-1553	Direct coupled primary bus
38	DNC		Do not connect
39	DNC		Do not connect
40	DNC		Do not connect
41	DATAT(0)-	MIL-STD-1553	Transformer coupled primary bus
42	DNC		Do not connect
43	DNC		Do not connect
44	DNC		Do not connect
45	DNC		Do not connect
46	DATAT(1)-	MIL-STD-1553	Transformer coupled secondary bus
47	DNC		Do not connect
48	DNC		Do not connect
49	DNC		Do not connect
50	DATAD(1)-	MIL-STD-1553	Direct coupled secondary bus
51	DNC		Do not connect
52	CHASSIS	KAM-500 chassis	Double-density connector only

## Ordering Information

PART NUMBER	DESCRIPTION
KAD/MSB/103/C	52-way double-density mating connector (transformer coupled/direct coupled)
KAM/MSB/103/C	51-way micro-miniature mating connector (transformer coupled/direct coupled)

When ordering, specify which connector (for KAD orders, ASD/MSB/001/TC for transformer coupled or ASD/MSB/001/DC for direct coupled; for KAM orders, ACC/CON/029 for transformer coupled, or ACC/CON/009 for direct coupled) is preferred. Its part number will be added to the Confirmation of Order unless an alternative option is specified (see the Cables data sheet). For details of the version of this module with Mode Code 17 support, contact Curtiss-Wright support (acra-support@curtisswright.com).

## Revision history

REVISION	DIFFERENCES	STATUS
KAD/MSB/103/C	Message capturing changed to allow storing of traffic when either a RxRT or TxRT fails to respond	Recommended for new programs
KAD/MSB/103/B	Dual redundant MIL-STD-1553 bus monitor with Mode Code 17 support and 3K deep selective FIFO for traffic and tags (snarfer)	Not recommended for new programs
KAD/MSB/103	First release	Not recommended for new programs

## Supporting software

SOFTWARE	DETAILS
DAS Studio 3	User interface for setup and management of data acquisition, network switches, recorders and ground stations in an integrated environment
KSM-500	This module is supported by the KSM-500 suite of software tools

## Related documentation

DOCUMENT	DETAILS
DOC/DBK/001	Acra KAM-500 Databook
DOC/HBK/002	Environmental Qualification Handbook
DOC/MAN/018	KSM-500 Databook
DOC/MAN/030	DAS Studio 3 User Manual
TEC/NOT/004	MIL-STD-1553
TEC/NOT/016	Power dissipation
TEC/NOT/049	Power estimation

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