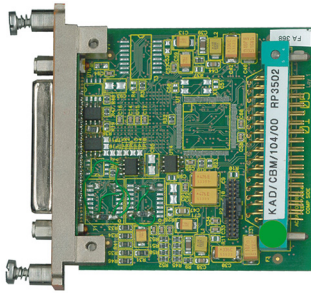


KAD/CBM/104

4-bus CSDB monitor

**CURTISS-
WRIGHT**

CURTISSWRIGHTDS.com



Key Features

- Four Commercial Standard Data Bus (CSDB) busses
- 16-bit Content Identifier (CI) covering address byte and status or first data byte
- Parsing of up to 127 complete messages and one catchall buffer per bus
- Tagging of messages with time and message count
- Up to 32 bytes per message

Applications

- CSDB bus monitors

Overview

The KAD/CBM/104 extracts valid CSDB messages from incoming serial streams. It coherently extracts certain words from these messages and saves them to specified locations in the telemetry frames (parser). The KAD/CBM/104 parses CSDB bus traffic and tags each message for up to four CSDB busses. It combines a message first in first out, a coherent message parser, and a message counter with error detection functions in a single module.

In this document, traffic refers to bytes on the bus and tags refer to associated information such as microsecond time of last byte of the message, message count, and errors.

The parser triple buffers up to 127 unique complete messages per bus and their associated tags. The MessageInfo tag associated with each message has a stale bit (message read before), a skipped bit (buffer overwritten), and an empty bit (no message received since power-on). The MsgCnt tag increments on receipt of a valid message. The Report word contains bits which indicate when an error has occurred, and on which bus it has occurred.

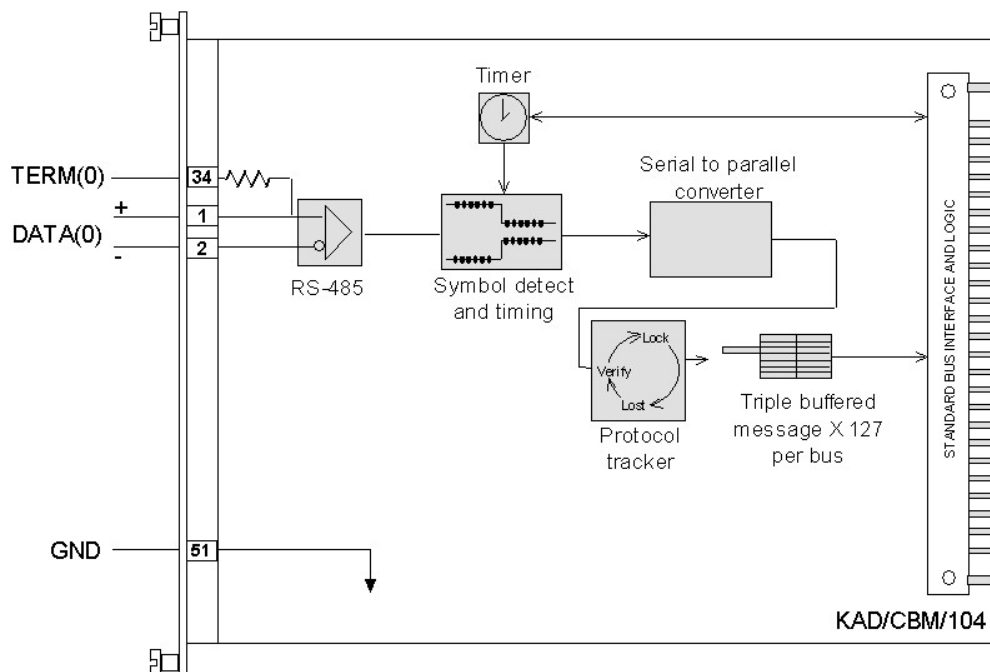


Figure 1: First of four independent busses

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						
	–	66	–	g		
	–	2.33	–	oz	Design metric is grams.	
Height above chassis					For recommended clearance requirements see the <i>CON/KAD/002/CP</i> data sheet.	
bare connector	–	–	11	mm		
bare connector	–	–	0.43	in.	Design metric is millimeters.	
Access rate	–	–	2	Msp/s	Maximum combined access rate for read and write.	
Power consumption						
+5V	60	–	140	mA		
±7V	0	–	0	mA		
±12V	0	–	0	mA		
total power	0.30	–	0.70	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 CSDB bus interface

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	-	-	4	-	RS-422 compatible.
Signalling rate					
Data[3:0]±	12.5		50	kbps	
Input voltage					
operating range	-7	-	12	V	Do not exceed operating range.
logic '0'	-	-	-0.2	V	$V_{IN+} - V_{IN-}$
logic '1'	0.2	-	-	V	$V_{IN+} - V_{IN-}$
overvoltage protection	-60	-	60	V	Voltage in excess of these values can damage input.
ESD protection	-	15	-	kV	Human Body Model.
Input resistance					
between inputs	-	150	-	k Ω	Module powered on.
between inputs	-	60	-	k Ω	Module powered off.
between inputs	-	124	-	Ω	Module powered on and inputs terminated.
between inputs	-	124	-	Ω	Module powered off and inputs terminated.
each input to GND	-	30	-	k Ω	Module powered on.
each input to GND	-	50	-	k Ω	Module powered off.

Setting up the KAD/CBM/104

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

The following treeview provides an overview of setup configurations available for this module:

Treeview icons legend	
<ul style="list-style-type: none">  DAU: Data Acquisition Unit  PC: Personal Computer  Instrument: Any component or module used in a data acquisition system  DataLink: Connection for transmitting or receiving (defines both the data link and the physical layer)  Package: Used to describe how data is transmitted or stored  Parameter: Any register that can be read from an instrument  Algorithm: Defines processing to be performed on data  InterConnect: Represents a physical connection on an instrument  PCI card: Circuit board that plugs into the PCI bus on a PC 	<ul style="list-style-type: none">  Indicator: Indicates the firing of an event based on specific conditions  Parser slot: Area of memory reserved for storing parsed data  Snarfer: Captures all data transmitted on a bus and selectively stores it  Bridge: Electrical circuit usually used for measuring purposes  PCMCIA card: Peripheral interface device usually for use in laptop computers  Multiplexer: Selects one of many input signals and outputs that signal on a signal line  Channels: Defines settings for input or output channels on an instrument

Instrument Overview



Setting up the module

The following table lists the setup configurations available for the KAD/CBM/104.

SETUP DATA	CHOICE	DEFAULT	NOTES
Manufacturer	-	-	-
Name	ACRA CONTROL	ACRA CONTROL	Name of manufacturer.
PartReference	KAD/CBM/104	KAD/CBM/104	Acra part number.
SerialNumber	-	-	Unique name for each module.
InterConnects			
Channel(3:0)	No character limit	Not Specified	Connection between the module channel and the CSDB data bus.
Settings	-	-	-
Module-Parser-1.0	-	-	-
PackageBuffers	-	-	-
PackageBuffer			
Parser(126:0)	-	-	CSDB message parser, parses up to 127 unique messages.
PackageReference	No character limit	Not Specified	-
PackageBuffer	-	-	CSDB catchall message parser.
Catchall-Parser(0:0)			
PackageReference	No character limit	Not Specified	-
Other	-	-	-

Setting up parameters

Parameter definitions

The following table lists all parameters that are available for the KAD/CBM/104.

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
ReadCounter Increments on each read.	Unitless	OffsetBinary	16	R[15:0] Increments on each read.
Report Indicates the status of the monitor.	Unitless	BitVector	16	R(15) 1 indicates an error occurred since last read. R[14:8] Reserved for future use. R[7:4] Indicates the bus the error occurred on. R[1:0] Error code. 0 - No error. 1 - Bit error.
MessageTimeHi Hours and minutes time of the last byte in the message.	Unitless	BitVector	16	R[15:13] Reserved for future use. R[12:7] BCD 00-23 hours. R[6:0] BCD 00-59 minutes.
MessageTimeLo Seconds and centiseconds time of the start of the last byte in the message.	Second	BCD	16	R[15:0] BCD 00.00-59.99 seconds.
MessageTimeMicro Microsecond time of the start of the last character in message.	Second	BCD	16	R[15:0] BCD 0000-9999 microseconds.
MessageCounter The current value of the frame count for each bus.	Count	OffsetBinary	16	R[15:0] 0000-FFFF.
MessageSize The number of bytes in the message.	Unitless	OffsetBinary	16	R[15:4] Reserved for future use. R[3:0] The number of bytes in the message. 0x0000 not allowed. 0x0003 three bytes (minimum). 0x000F 16 bytes (maximum).

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
MessageInfo Stale/skipped indication for this parsed message.	Unitless	BitVector	16	R(15) 1 indicates ID is empty (no message received). R(14) 1 indicates stale (this message was read before). R(13) 1 indicates skipped (this message overwrote another). R[12:0] Reserved for future use.
MessageData Received data N.	Unitless	OffsetBinary	16	R[15:8] The eight bits of byte 2 x N + 1 in serial stream. R[7:0] The eight bits of byte 2 x N in serial stream. Where N is data word index (zero-based).

Setting up data links

A data link is a connection for transmitting and receiving data. It defines both the data link and physical layers of the link. The following are data links supported by the KAD/CBM/104.

Non-programmable data links

NAME	DESCRIPTION
Channel(3:0)	CSDB data link.

Setting up packages

A package is a logical description of how data is transmitted or stored.

ClassifiedNetworkPackages

CSDB package containing acquisition data to be received.

SETUP DATA	CHOICE	DEFAULT	NOTES
ReferencedToAbsoluteTime	-	-	-
PackageRate	-	-	-
DataLinkReference	No character limit	Not Specified	-
Properties	-	-	-
HashBinary	-	-	HashBinary is used to specify values to be found at the classification offset.
Value	-	-	This is a 16-bit binary value used for packet classification. Its context is defined by its sibling OffsetIndex_Bytes.
OffsetIndex_Bytes	0:0	Not Specified	This element sets the context for packet classification.
Content	-	-	-
Parameter	-	-	-
Location	-	-	-
Offset_Bytes	16:0	Not Specified	-

CatchAllPackage

CSDB catchall package definition.

SETUP DATA	CHOICE	DEFAULT	NOTES
ReferencedToAbsoluteTime	-	-	-
PackageRate	-	-	-
DataLinkReference	No character limit	Not Specified	-
Properties	-	-	-
HashBinary	-	-	HashBinary is used to specify values to be found at the classification offset. However, as this is a catchall package definition the hash binary value will be fixed.
Value	*****	*****	This wildcard value is fixed for the catchall package definition.
OffsetIndex_Bytes	0:0	Not Specified	This element sets the context for packet classification.
Content	-	-	-
Parameter	-	-	-
Location	-	-	-
Offset_Bytes	16:0	Not Specified	-

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

Getting the most from the KAD/CBM/104

Parser

The KAD/CBM/104 can parse up to 127 messages into individual slots and has one catchall slot reserved for each bus. The CSDB frame structure is shown in the following figure. Idle time is a minimum of 11 bits, Interblock time has no restrictions, and the sync block consists of a predefined number of A5h characters.

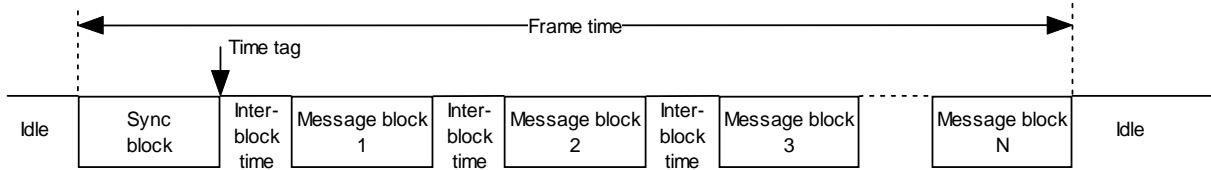


Figure 2: Frame structure

The message block structure is shown in the following figure.

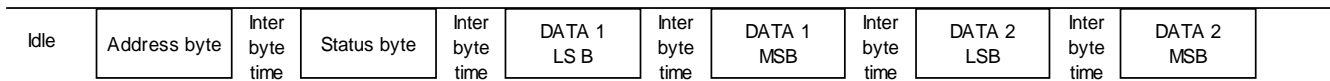


Figure 3: Message block structure

The byte structure is shown in the following figure. It is the same as the byte definition used in the RS-232 communication protocol.

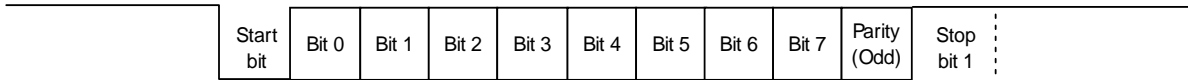


Figure 4: Byte structure

In order to keep coherency, each slot is triple buffered. If messages arrive faster than the backplane controller module (KAD/BCU/xxx) can read them, a skipped bit indicates that a message has been missed. If messages arrive slower than the rate at which the KAD/BCU/xxx is reading, a stale bit indicates that the same message has been read before. Each message is individually time stamped and counted.

Messages are individually identified by a 16-bit CI, which covers the first two bytes of each message.

NOTE: To avoid reporting of errors from unused busses, ensure that busses are correctly terminated.

Connector pinout of the KAD/CBM/104

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	DATA(0)+	CSDB bus interface	High level CSDB bus (receive only)
2	DATA(0)-	CSDB bus interface	Low level CSDB bus (receive only)
3	DATA(1)+	CSDB bus interface	High level CSDB bus (receive only)
4	DATA(1)-	CSDB bus interface	Low level CSDB bus (receive only)
5	DATA(2)+	CSDB bus interface	High level CSDB bus (receive only)
6	DATA(2)-	CSDB bus interface	Low level CSDB bus (receive only)
7	DATA(3)+	CSDB bus interface	High level CSDB bus (receive only)
8	DATA(3)-	CSDB bus interface	Low level CSDB bus (receive only)
9	CHASSIS	Chassis	
10	CHASSIS	Chassis	
11	GND	Internal ground	
12	GND	Internal ground	
13	GND	Internal ground	
14	DNC		Do not connect
15	DNC		Do not connect
16	DNC		Do not connect
17	DNC		Do not connect
18	DNC		Do not connect
19	DNC		Do not connect
20	DNC		Do not connect
21	DNC		Do not connect
22	DNC		Do not connect
23	DNC		Do not connect
24	DNC		Do not connect
25	DNC		Do not connect
26	DNC		Do not connect
27	GND	Internal ground	
28	GND	Internal ground	
29	DNC		Do not connect
30	DNC		Do not connect
31	DNC		Do not connect
32	DNC		Do not connect
33	DNC		Do not connect
34	DATA(0)_TRM+	CSDB bus interface	CSDB bus interface; with internal 124Ω resistor
35	DNC		Do not connect
36	DATA(1)_TRM+	CSDB bus interface	CSDB bus interface; with internal 124Ω resistor
37	DNC		Do not connect
38	DATA(2)_TRM+	CSDB bus interface	CSDB bus interface; with internal 124Ω resistor
39	DNC		Do not connect
40	DATA(3)_TRM+	CSDB bus interface	CSDB bus interface; with internal 124Ω resistor
41	DNC		Do not connect
42	DNC		Do not connect
43	DNC		Do not connect
44	DNC		Do not connect
45	DNC		Do not connect
46	DNC		Do not connect
47	DNC		Do not connect
48	DNC		Do not connect
49	DNC		Do not connect
50	GND	Internal ground	
51	GND	Internal ground	
52	CHASSIS	Chassis	

Ordering information

PART NUMBER	DESCRIPTION
KAD/CBM/104	4-bus CSDB monitor

By default, the standard mating connector, CON/KAD/002/CP, is included with each module in the shipment. Its part number will be added to the Confirmation of Order unless an alternative option is specified (see the *Cables* data sheet).

Revision history

REVISION	DIFFERENCES	STATUS
KAD/CBM/104	First release	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

Related documentation

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

This page is intentionally blank