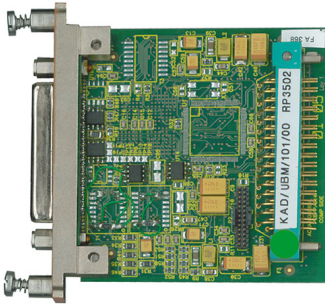


# KAD/UBM/101

8-channel RS-422 or RS-485 serial bus packetizer

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## Key Features

- Bit-rates from 300bps to 1,000,000bps
- Seven or eight bits per character with odd/even/none parity
- One or more stop bits
- Time tags first bit of packet to one  $\mu$ s (microsecond)
- Handles aperiodic transmission

## Applications

- Interfacing with serial data links

## Overview

The KAD/UBM/101 is an eight-channel serial bus packetizer. It can capture eight independent serial streams. All data appearing on the bus is packetized and character-aligned.

The KAD/UBM/101 captures and packetizes data until a packet of a pre-defined size is full, or a pre-defined timeout is exceeded.

The KAD/UBM/101 uses iNET-X bit-aligned packet format. Characters are packed into the packet without padding. The characters received from RS-422/RS-485 are stored as Most Significant Bit (MSB) first. Characters can be packed into the packet with or without parity.

Baud rate, parity and character size can be set per channel.

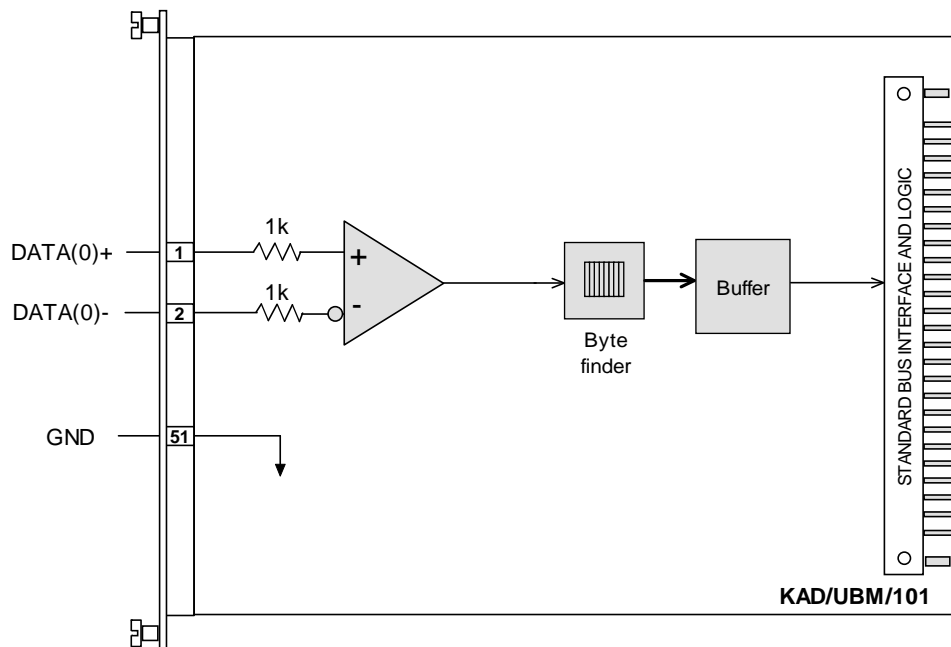


Figure 1: First of eight channels of the KAD/UBM/101

## 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						
	–	70	–	g		
	–	2.47	–	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	Mbps	Maximum combined access rate for read and write.	
Power consumption						
+5V	–	87	–	mA		
±7V	–	0	–	mA		
±12V	–	0	–	mA		
total power	–	0.435	–	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		RS-422 inputs				
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS	
Inputs	–	–	8	–		
Signalling rate						
DATA[7:0]	0.0003	–	1	Mbps		
Input voltage						
operating range	-25	–	25	V	Do not exceed operating range.	
logic 0	–	–	0.2	V	(50mV hysteresis) $V_{IN+} - V_{IN-}$	
logic 1	0.2	–	–	V	(50mV hysteresis) $V_{IN+} - V_{IN-}$	
common mode voltage	-20	–	25	V		
overvoltage protection	-27	–	27	V	Voltage in excess of these values can damage input.	
ESD protection	–	16	–	kV	Human Body Model.	
Input resistance						
between inputs	24	–	–	k $\Omega$	Module powered on.	
between inputs	24	–	–	k $\Omega$	Module powered off.	
each input to GND	12	–	–	k $\Omega$	Module powered on.	
each input to GND	12	–	–	k $\Omega$	Module powered off.	

## Setting up the KAD/UBM/101

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/UBM/101	KAD/UBM/101	The instrument part reference.
SerialNumber	AB1234	AB1234	Unique name for each module.
Channels	-	-	-
Serial(7:0)	-	-	Represents a typical serial channel on an instrument.
RS-422 Input	-	-	-
Settings	-	-	-
Baud Rate	300 to 1e6	9600	Specifies the number of symbols transmitted per second.
Parity	Odd Even None	NoParity	Defines the parity mode for the channel.
Character Size	7 8	8	Number of bits per serial character.
Packet Size	9 to 511	511	Size of packet buffer in words.
Packet Timeout	1 to 1000	10	Generate a packet when the oldest data recorded is this old (in milliseconds).
Stream Id	0 to FFFFFFFF	FFFFFFF	Stream Id of packets on this channel.
Parity Filter	No Yes	Yes	Filter parity bits from the packetized data, if parity is enabled for the channel.
Packetization Enabled	True False	False	-

### Parameter definitions

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
Global Parameters				
Report This is the default description for a new parameter definition.	BitVector	BitVector	16	R[15:0] R(15) FreshError - Set to 1 when a new error occurs. R[14:11] Reserved - Reserved for future use. R[10:8] Bus - Indicates bus where the error happened. R[7:3] Reserved - Reserved for future use. R[2:0] ErrorCode - Indicates type of error. 000: No Error. 001: Parity error. 010: Framing error.

**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/UBM/101

### Packet format

The packet format is bit-aligned with no padding and the iNET-X standard requires that the payload is aligned to a 32-bit, two-word boundary. To ensure that each packet is aligned to a 32-bit boundary, there is a limited number of packet sizes for each character size. The characters received from RS-422/RS-485 are stored as MSB first. For example, the incoming 8-bit characters 0x01 0x02 0x03 0xAA are stored as 0x80 0x40 0xC0 0x55. Allowable iNET-X payload sizes for each character size are listed in the following table.

CHARACTER		iNET-X payloads		
LENGTH [BITS]	PARITY FILTER	MINIMUM LENGTH [16-BIT WORDS]	MAXIMUM LENGTH [16-BIT WORDS]	GRANULARITY [16-BIT WORDS]
7	Yes	14	504	14
7	No	2	504	2
8	Yes	2	504	2
8	No	18	504	18

In the event of a timeout, if there is data in the module which is less than the granularity of the packet size, this data is held for the next packet.

**NOTE:** For RS-485 operation, the source drivers go into a tri-state mode. In a noisy environment, while in this mode, noise on the source signals may result in the KAD/UBM/101 detecting a start bit (0). The KAD/UBM/101 accepts the next 7/8 bits and insert these bits as a character into the packet.

## Connector pinout of the KAD/UBM/101

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	DATA(0)+	RS-422 inputs	Data in
2	DATA(0)-	RS-422 inputs	Data in
3	DATA(1)+	RS-422 inputs	Data in
4	DATA(1)-	RS-422 inputs	Data in
5	DATA(2)+	RS-422 inputs	Data in
6	DATA(2)-	RS-422 inputs	Data in
7	DATA(3)+	RS-422 inputs	Data in
8	DATA(3)-	RS-422 inputs	Data in
9	CHASSIS	Chassis	
10	CHASSIS	Chassis	
11	GND	Internal ground	
12	GND	Internal ground	
13	GND	Internal ground	
14	DNC		Do not connect
15	DATA(4)+	RS-422 inputs	Data in
16	DATA(4)-	RS-422 inputs	Data in
17	DATA(5)+	RS-422 inputs	Data in
18	DATA(5)-	RS-422 inputs	Data in
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	DATA(6)+	RS-422 inputs	Data in
26	DATA(6)-	RS-422 inputs	Data in
27	GND	Internal ground	
28	GND	Internal ground	
29	DATA(7)+	RS-422 inputs	Data in
30	DATA(7)-	RS-422 inputs	Data in
31	DNC		Do not connect
32	DNC		Do not connect
33	DNC		Do not connect
34	DNC		Do not connect
35	DNC		Do not connect
36	DNC		Do not connect
37	DNC		Do not connect
38	DNC		Do not connect
39	DNC		Do not connect
40	DNC		Do not connect
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/UBM/101	8-channel RS-422 or RS-485 serial bus packetizer

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/UBM/101	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
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/GBK/002	Environmental Qualification Handbook
DOC/MAN/018	KSM-500 Databook
DOC/MAN/030	DAS Studio 3 User Manual
TEC/NOT/016	Power dissipation
TEC/NOT/049	Power estimation