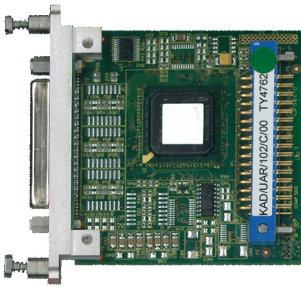


# KAD/UAR/102

RS-232/RS-422/RS-485 universal asynchronous parser and snarfer  
- 4ch

**CURTISS-  
WRIGHT**

CURTISSWRIGHTDS.COM



## Key Features

- Monitors up to four RS-422/485/232 busses
- Coherently parses traffic and tags for up to 125 messages from 4 to 512 bytes
- 2K words deep per channel (snarfer)
- Bit-rates from 300bps to 1,000,000bps
- 7/8 bits per word with odd, even or no parity
- Programmable start sequence (1 to 8 bytes), stop sequence (1 byte or by fixed length) and idle time

## Applications

- Interfacing with serial data links

## Overview

The KAD/UAR/102 is used to parse (coherently extract specific bytes) and snarf (send all data to a FIFO) up to four RS-232/422/485 channels. The module is able to parse and snarf each channel at the same time.

The signal type (RS-232/422/485), bits per word and parity are programmable on a channel-by-channel basis. The bit-rates must be binary multiples of each other.

In the parser, a total of up to 125 complete messages are triple buffered so that the stale indication is message-wide. Each message can be up to 512 characters (bytes) long (including start and stop characters). Each message is tagged to 0.1ms resolution; a message is considered found when a start sequence of between 4 and 8 specific bytes is received.

The end of message byte is determined by a user-defined stop character or specific number of words. A message is not updated if any sequence is incorrect.

The snarfer stores all data from each bus in a separate FIFO 2K words deep.

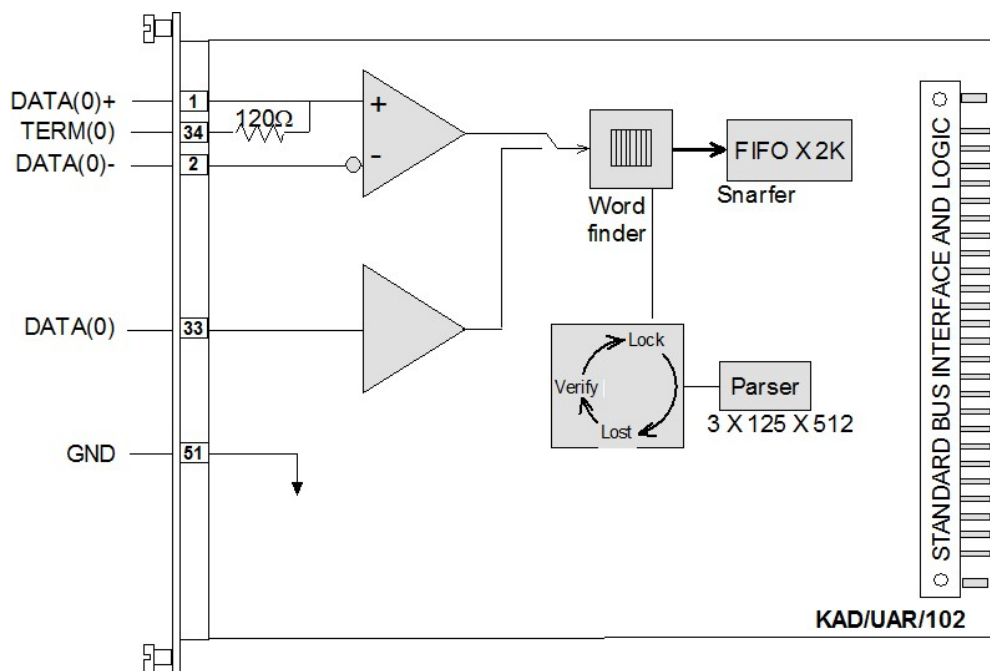


Figure 1: First of four channels of the KAD/UAR/102

## 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		
	–	2.49	–	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	–	85	94	mA		
±7V	–	0	0	mA		
±12V	–	0	0	mA		
total power	–	0.425	0.470	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	–	–	4	–		
Signalling rate						
DATA	0.0003	–	1	Mbps	NRZ-L (8Mbps for BIØ-L).	
Input voltage						
operating range	-25	–	25	V	Do not exceed operating range.	
logic ‘0’	–	–	0.2	V	(130mV hysteresis) $V_{IN+} - V_{IN-}$ .	
logic ‘1’	0.2	–	–	V	(130mV 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	–	–	kΩ	Module powered on/off.	
between inputs	–	120	–	Ω	Module powered on/off and inputs terminated.	
each input to GND	12	–	–	kΩ	Module powered on/off.	

**TABLE 3** RS-232 inputs

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Inputs	–	–	4	–	
Signaling rate					
DATA[3:0]	0.0003	–	1	Mbps	
Input voltage					
operating range	-25	–	25	V	Do not exceed operating range.
logic '0'	–	–	0.6	V	
logic '1'	2.4	–	–	V	
overvoltage protection	-25	–	25	V	Voltages outside of this range can damage input.
ESD protection	-15	–	15	kV	Human Body Model.
Input resistance					
each input to GND (on)	–	4.8	–	MΩ	Module powered on.
each input to GND (off)	–	4.7	–	kΩ	Module powered off.

## Setting up the KAD/UAR/102

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/UAR/102/C	KAD/UAR/102/C	The instrument part reference.
SerialNumber	AB1234	AB1234	Unique name for each module.
Processes	-	-	-
Parser(124:0)	-	-	-
Channels	-	-	-
Serial-In(3:0)	-	-	Connection between the module channel and RS232/422/485 data bus.
Serial Input Settings	-	-	-
Signal Type	RS-422 RS-485 RS-232	RS-422	Type of data stream.
Baud Rate	300 600 1200 2400 4800 9600 14400 19200 38400 57600 62500 76800 115200 208300 230400 250000 312500 345600 352500 360000 460800 625000 694444 781250 892857 921600 500000 1000000 1041666	9600	Specifies the number of symbols transmitted per second.
Data Bits Per Word	7 8	8	Bits per word.

SETUP DATA	CHOICE	DEFAULT	NOTES
Parity	None Odd Even	None	Parity of word.
Idle Time Sync Interval	0 to 63	0	Time in ms between consecutive characters required before starting new message (Note: Must be in range 2-63 ms or 0 ms. Setting to 1 ms is invalid).

### Parameter definitions

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
Global Parameters				
Report Indicates the status of the monitor.	BitVector	BitVector	16	R[15:0] R(15) ErrorIndicator - 1 indicates an error occurred since last read. R[14:13] BusNumber - The bus the error occurred on. R[12:4] Reserved - Reserved for future use R[3:0] ErrorCodes 0001: Parity error 0010: Bad stop bit 0100: Too many data words. Other: Reserved for future use
Parser(124:0) Parameters				
MessageSize Number of received bytes (including start bytes ) example 1+3 = 4 bytes in a message. Minimum length of message is 4 bytes (3 bytes of start sequence plus 1 stop byte or at least 1 byte in case of fixed length message).	Count	OffsetBinary	16	R[15:0]
MessageIrigTime48 48-bit wide IRIG time word.	BitVector	BitVector	48	R[47:0]
MessageTimeHi Hours and minutes time of the last character in message.	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
MessageTimeLo Seconds and centiseconds time of the start of the last character in message.	Second	BCD	16	R[31:16] R(15) Reserved - Reserved for future use R[14:8] Seconds - Seconds 0 to 59 R[7:0] Centiseconds - Centiseconds 0 to 99
MessageTimeMicro Microsecond time of the start of the last character in message.	Second	BCD	16	R[15:0] R[15:0] Microseconds - Microseconds 0 to 9999

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
MessageInfo Indicates status of message.	BitVector	BitVector	16	R[15:0] R(15) Empty - This slot is empty. R(14) Stale - Contents of this slot have already been read. R(13) Skipped - Contents of this slot have been over-written. R[12:0] Reserved - Reserved for future use.
MessageCount Count of messages detected on the bus.	Count	OffsetBinary	16	R[15:0]
Serial-In(3:0) Parameters				
Snarfer Snarfer Register	BitVector	BitVector	16	R[15:0] R[15:8] FifoData - The 8/7 bits received. R(15) is the First Bit Transmitted R(7) FifolsEmpty - 1 indicates the FIFO is empty R(6) FifoWasFull - 1 indicates the FIFO was full R[5:0] Reserved - Reserved for future use

**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/UAR/102

It is important to ground (GND) each source of RS-232, RS-422 or RS-485. The following figure shows how to optionally terminate the RS-422 and RS-485 receivers by using the internal termination resistor provided on the module (TERM pin). Star grounding provides optimal noise rejection. For details on grounding, see *TEC/NOT/063 - Grounding and shielding of the Acra KAM-500*.

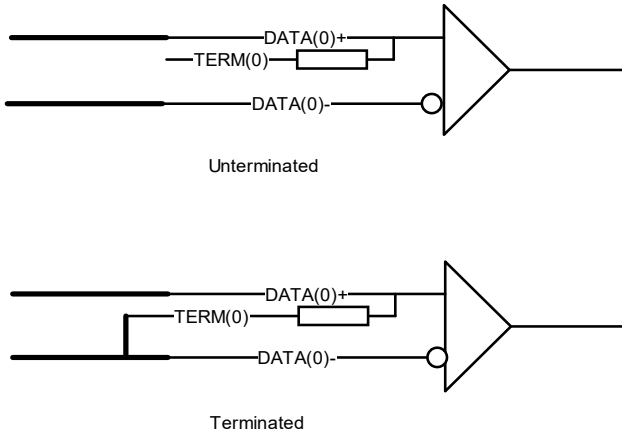


Figure 2: Optional RS-422/RS-485 third pin termination

### Maximum message length

The maximum message length is 512 bytes. This length includes the bytes used for the start pattern and the end byte (if an end byte is used).

### Interval between messages

The interval between the start patterns of messages must be at least 8 bytes in order for the KAD/UAR/102 to parse the message.

For example, if a message 6 bytes in length is parsed, then a following message whose start sequence includes either of the next 2 bytes will not be detected or parsed.

## Error codes for the KAD/UAR/102

CODE <sup>1</sup>	DESCRIPTION
1 <sub>16</sub>	Parity error.
2 <sub>16</sub>	Bad stop bit.
4 <sub>16</sub>	Last character not found in 512 characters.
0 <sub>16</sub> , 3 <sub>16</sub> , 5 <sub>16</sub> , 6 <sub>16</sub> , 7 <sub>16</sub>	Reserved for future use.

1. Error codes are in hexadecimal.

### Parser data word definition

Consider a hexadecimal stream with 0x40, 0x41, 0x42, 0x43, 0x44, and 0x45:

Data position 0: DW0 is 0x4041

Data position 1: DW1 is 0x4140

Data position 2: DW2 is 0x4243

Data position 3: DW3 is 0x4342

Data position 4: DW4 is 0x4445

Data position 5: DW5 is 0x4544 (and so on)

## Connector pinout of the KAD/UAR/102

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	DATA(0)+	RS-422 inputs	Data in; differential ended alternative to Pin 33
2	DATA(0)-	RS-422 inputs	Data in; connect to pin 34 for 120Ω termination
3	DATA(1)+	RS-422 inputs	Data in; differential ended alternative to Pin 35
4	DATA(1)-	RS-422 inputs	Data in; connect to pin 36 for 120Ω termination
5	DATA(2)+	RS-422 inputs	Data in; differential ended alternative to Pin 37
6	DATA(2)-	RS-422 inputs	Data in; connect to pin 38 for 120Ω termination
7	DATA(3)+	RS-422 inputs	Data in; differential ended alternative to Pin 39
8	DATA(3)-	RS-422 inputs	Data in; connect to pin 40 for 120Ω termination
9	DNC		Do not connect
10	DNC		Do not connect
11	DNC		Do not connect
12	DNC		Do not connect
13	DNC		Do not connect
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	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	DNC		Do not connect
33	DATA(0)	RS-232 inputs	Data in; single ended alternative to pin 1
34	TERM(0)	RS-422 inputs	Connect to pin 2 for 120Ω termination
35	DATA(1)	RS-232 inputs	Data in; single ended alternative to pin 3
36	TERM(1)	RS-422 inputs	Connect to pin 4 for 120Ω termination
37	DATA(2)	RS-232 inputs	Data in; single ended alternative to pin 5
38	TERM(2)	RS-422 inputs	Connect to pin 6 for 120Ω termination
39	DATA(3)	RS-232 inputs	Data in; single ended alternative to pin 7
40	TERM(3)	RS-422 inputs	Connect to pin 8 for 120Ω termination
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	KAM-500 chassis	Double-density connector only



## Ordering information

PART NUMBER	DESCRIPTION
KAD/UAR/102/C	RS-232/RS-422/RS-485 universal asynchronous parser and snarfer - 4ch (with 52-way double-density connector)
KAM/UAR/102/C	RS-232/RS-422/RS-485 universal asynchronous parser and snarfer - 4ch (with 51-way micro-miniature connector)

By default, the standard mating connector, (CON/KAD/002/CP for KAD modules; or ACC/CON/008/04 for KAM modules), 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). In this data sheet, KAD/UAR/102 refers to both the KAD and KAM version of the module.

## Revision history

REVISION	DIFFERENCES	STATUS
KAD/UAR/102/C	Minimum message length reduced to 4 bytes instead of 9	Recommended for new programs
KAD/UAR/102/B	Optimized to allow DAS Studio 3 more flexibility in parameter placement	Not recommended for new programs
KAD/UAR/102	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/MAN/018	KSM-500 Databook
DOC/MAN/030	DAS Studio 3 User Manual
DOC/GBK/002	Environmental Qualification Handbook
TEC/NOT/016	Power dissipation
TEC/NOT/049	Power estimation
TEC/NOT/062	Using the KAD/UAR/102
TEC/NOT/063	Grounding and shielding of the Acra KAM-500

*This page is intentionally blank*