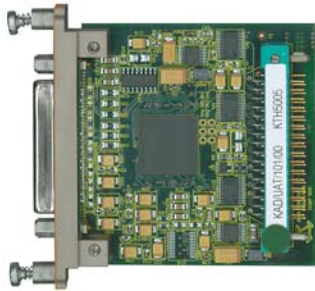


KAD/UAT/101

RS-232/422 asynchronous transmitter - 4ch

**CURTISS -
WRIGHT**



FEATURES

- Four independent single ended RS-232 output channels
- Four independent differential ended RS-422 output channels
- Bit-rates from 600bps to 1,000,000bps
- Seven/eight bits per character with odd/even or no parity
- Programmable one or two stop bits
- Maximum message length of 8,184 characters
- Messages periodically transmitted either synchronously or asynchronously to the acquisition cycle

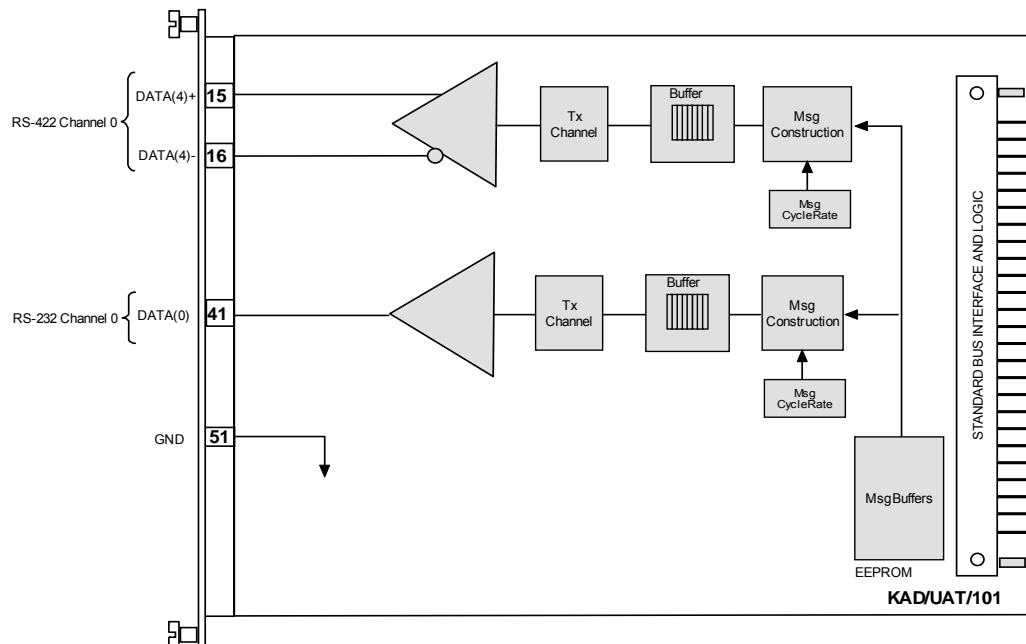
APPLICATIONS

- Periodically transmit messages to modules

DESCRIPTION

The KAD/UAT/101 is a universal asynchronous transmitter supporting up to four RS-232 channels and four RS-422 channels. Each of the eight channels is configured independently for the bit-rate, the number of bits per word, the parity generation, and the number of stop bits.

Each channel supports messages with a maximum length of 8,184 characters. Messages are programmed in the MsgBuffer of the EEPROM before transmission is enabled. Transmission of messages is enabled when the module enters acquisition mode. Messages are transmitted periodically. A message can be sent synchronous to the acquisition cycle, that is, at the start of the cycle a message is transmitted. Messages can also be sent asynchronous to the acquisition cycle, in that the cycle rate of the message can be programmed with a minimum period of 1ms up to a maximum period of 65.536 seconds ($1\text{ms} \times 2^{16}$).



First RS-422 and first RS-232 channel of the KAD/UAT/101

Ordering Information

Part Number	Description
KAD/UAT/101	RS-232/422 asynchronous transmitter - 4ch (with 52-way double-density connector)
KAM/UAT/101	RS-232/422 asynchronous transmitter - 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/UAT/101 refers to both the KAD and KAM version of the module.

Revision History

Revision	Differences	Status
KAD/UAT/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

Specifications

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	
Height above chassis					For recommended clearance requirements see the CON/KAD/002/CP data sheet.
bare connector	–	–	11	mm	
bare connector	–	–	0.43	in	
Access rate	–	–	2	Msp/s	Maximum combined access rate for read and write.
Power consumption					
+5V	–	–	130	mA	Unloaded.
±7V	–	–	0	mA	Unloaded.
±12V	–	–	0	mA	Unloaded.
total power	–	–	0.65	W	Unloaded (chassis with 30W load).
+5V	–	–	175	mA	Loaded.
±7V	–	–	0	mA	Loaded.
±12V	–	–	0	mA	Loaded.
total power	–	–	0.875	W	Loaded (chassis with 30W load). Particular combinations of chassis and Acra KAM-500 modules may have power or current limitations. For details, see TEC/NOT/016 - Power dissipation, TEC/NOT/049 - Power estimation, 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	

RS-422 outputs

Parameter	Min.	Typ.	Max.	Units	Condition/Details
Outputs	–	–	4	–	
Signaling rate					
maximum data rate	0.6	–	1000	kbps	
Output voltage					
absolute operating range	-7	–	12	V	For correct operation the voltage on the signal pins must remain within these limits.
logic 0	–	–	-2	V	$V_{0+} - V_{0-}; R_{LOAD} = 100\Omega$.
logic 1	2	–	–	V	$V_{0+} - V_{0-}; R_{LOAD} = 100\Omega$.
short circuit current	–	–	±250	mA	
short circuit duration	¥	–	–	s	Only one output may be shorted at a time.
ESD protection	–	±8	–	kV	Human Body Model.
Output resistance	–	5	–	W	

RS-232 outputs

Parameter	Min.	Typ.	Max.	Units	Condition/Details
Outputs	–	–	4	–	
Signaling rate					
maximum data rate	0.6	–	1000	kbps	
Output voltage					
absolute operating range	-25	–	25	V	For correct operation the voltage on the signal pins must remain within these limits.
logic '0'	5	–	–	V	R _{LOAD} = 3kΩ.
logic '1'	–	–	-5	V	R _{LOAD} = 3kΩ.
short circuit current	–	–	±60	mA	
short circuit duration	¥	–	–	s	Only one output may be shorted at a time.
Output resistance	–	500	–	W	

Setting up parameters

For MsgCounter

Set-up data	Choice	Default/Example	Notes
Name	MsgCounter(0) to MsgCounter(7)	MsgCounter(0)	Number of times a message is sent on each channel.
Base unit	Unitless	Unitless	R[15:0] = MsgCounter. Note: The register is not reset when read.
maximum	FFFF ₁₆	FFFF ₁₆	
minimum	0	0	
Data format	Offset binary	Offset binary	
Size in bits	16	16	

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

Setting up instrumentation

This module uses the X-Module-RS-232-Monitor XidML schema. (See <http://www.xidml.org>).

Set-up Data	Choices	Default/Example	Notes
Manufacturer			
name	ACRA CONTROL	ACRA CONTROL	
part reference	KAD/UAT/101	KAD/UAT/101	ACRA CONTROL part number.
serial number	Fixed 6 characters	FE1234	Unique number for each module.

Setting up packages

This module uses the X-RS-232-Basic-1.2 Package schema. (See <http://www.xidml.org>).

Set-up Data	Choices	Default/Example	Notes
DataLinkReference	Package Reference	MySerialDataLink	Reference to a DataLink defined in "Setting up datalinks" on page 5.
Properties	N/A	N/A	N/A
Content			
Parameter			
FillValue	00-FF ₁₆	41 ₁₆	Fill value
Location			

Set-up Data	Choices	Default/Example	Notes
Offset_Words	0-8183	0	The word offset for data words being transmitted in the package.

Setting up datalinks

This module uses the X-DataLink-1.3 Datalink schema. (See <http://www.xidml.org>).

Datalink definition for Channel(0) to Channel(3)

Set-up Data	Choices	Default/Example	Notes
Type	RS-232	RS-232	Type of serial stream.
ProtocolProperties			
Bit-Rate	1000000, 512000, 500000, 360000, 352500, 312500, 208300, 115200, 76800, 62500, 57600, 38400, 28800, 19200, 14400, 9600, 4800, 2400, 1200, 600	9600	The speed of the data stream.
Parity	Odd, Even, None	None	Parity of word.
DataBitsPerWord	7, 8	8	Data bits per word.
StopBits	1, 2	1	Stop bits.
PackageSequences			
ReferencedToAbsoluteTime	Yes, No	Yes	Yes – Synchronous mode No – Asynchronous Mode
SequencePeriod	1-65536	2000	The time in milliseconds for the message buffers on the module to transmit all data.
Package			
PackageReference	Package Reference	MyRS232Package	References a package defined in "Setting up packages" on page 4.

Datalink definition for Channel(4) to Channel(7)

Set-up Data	Choices	Default/Example	Notes
Type	RS-422	RS-422	Type of serial stream.
ProtocolProperties			
Bit-Rate	1000000, 512000, 500000, 360000, 352500, 312500, 208300, 115200, 76800, 62500, 57600, 38400, 28800, 19200, 14400, 9600, 4800, 2400, 1200, 600	9600	The speed of the data stream.
Parity	Odd, Even, None	None	Parity of word.
DataBitsPerWord	7, 8	8	Data bits per word.
StopBits	1, 2	1	Stop bits.
PackageSequences			
ReferencedToAbsoluteTime	Yes, No	Yes	Yes – Synchronous mode No – Asynchronous Mode
SequencePeriod	1-65536	2000	The time in milliseconds for the message buffers on the module to transmit all data.
Package			
PackageReference	Package Reference	MyRS422Package	References a package defined in "Setting up packages" on page 4.

Getting the most from the KAD/UAT/101

Each character in the 8,184 word MsgBuffer is framed according to the channel parameters. The channel parameters define the character size (seven/eight bits), the parity generation, and the number of stop bits.

Each channel provides a count of the number of times a message has been transmitted, using the MsgCounter parameter.

On power-up, the KAD/UAT/101 does not initiate transmission of messages until the module is in acquisition mode and the PLLs are locked. The PLLs take 10ms to lock. The first acquisition cycle, after the PLLs are locked, initiates message transmission. The KAD/UAT/101 selects one of the 15 formats (as specified by the controller module) that are stored in the EEPROM.

If the KAD/UAT/101 is transmitting a message and a new format is selected at the start of the acquisition cycle, the current message is transmitted to completion before transmission of a message for the new format commences. The PLLs must not be re-programmed with a different value when changing format.

If the module is switched from acquisition mode to programming mode, transmission of messages is terminated immediately.

NOTE: The KAD/UAT/101 transmits pre-defined fixed content messages that are stored in EEPROM during programming of the module. Parameters cannot be transmitted from the KAM-500 backplane through the KAD/UAT/101.

Maximum message length

The maximum message length is 8,184 words. The acquisition cycle (synchronous mode) or the cycle rate (asynchronous mode) must be long enough to support transmitting the message with the specified bit-rate and line parameters.

Bit-rate availability

A channel can use any of the following standard bit-rates:

1000000, 512000, 500000, 360000, 352500, 312500, 208300, 115200, 76800, 62500, 57600, 38400, 28800, 19200, 14400, 9600, 4800, 2400, 1200, 600.

Asynchronous mode

The following diagram illustrates the transmission of a message on a channel that has been configured in asynchronous mode. The first transmission of the message is aligned to the acquisition cycle (with an offset). Thereafter it is aligned to the cycle rate of the channel.

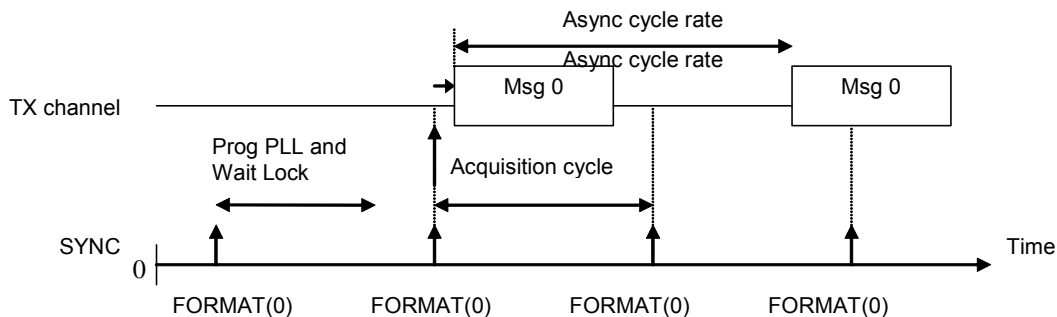


Figure 2: Transmission of a message on a single channel in asynchronous mode

Synchronous mode

Figure 3 on page 8 illustrates the transmission of a message on a channel that has been configured in synchronous mode. The transmission of all messages is synchronous to the acquisition cycle.

NOTE: The offset from the start of the acquisition cycle to when the message is sent.

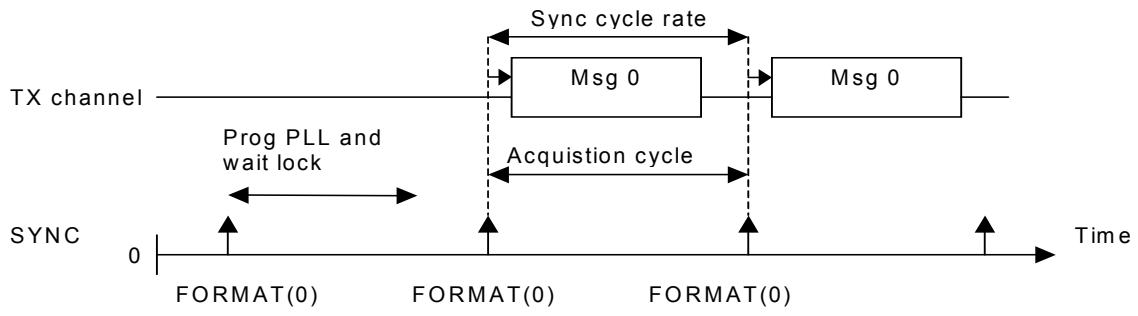


Figure 3: Transmission of a message on a single channel in synchronous mode

This page is intentionally blank

Connector pinout of the KAD/UAT/101

Pin	Pin	See specifications table	Comment
1	DNC		Do not connect
2	DNC		Do not connect
3	DNC		Do not connect
4	DNC		Do not connect
5	DNC		Do not connect
6	DNC		Do not connect
7	DNC		Do not connect
8	DNC		Do not connect
9	DNC		Do not connect
10	DNC		Do not connect
11	GND	Internal ground	
12	GND	Internal ground	
13	GND	Internal ground	
14	DNC		Do not connect
15	Data(4)+	RS-422 outputs	Differential ended
16	Data(4)-	RS-422 outputs	Differential ended
17	Data(5)+	RS-422 outputs	Differential ended
18	Data(5)-	RS-422 outputs	Differential ended
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 outputs	Differential ended
26	Data(6)-	RS-422 outputs	Differential ended
27	GND	Internal ground	
28	GND	Internal ground	
29	Data(7)+	RS-422 outputs	Differential ended
30	Data(7)-	RS-422 outputs	Differential ended
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	Data(0)	RS-232 outputs	Single ended
42	DNC		Do not connect
43	Data(1)	RS-232 outputs	Single ended
44	DNC		Do not connect
45	Data(2)	RS-232 outputs	Single ended
46	DNC		Do not connect
47	Data(3)	RS-232 outputs	Single ended
48	DNC		Do not connect
49	DNC		Do not connect
50	GND	Internal ground	
51	GND	Internal ground	
52	CHASSIS	Chassis	Double-density connector only