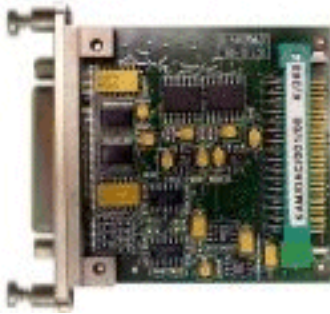


KAD/DAC/001

8-channel analog outputs with 16-channel discrete outputs



Key Features

- Eight single ended analog output channels
- Input range of $\pm 10V$
- Lookup tables to map input parameter to analog output
- 16 single ended discrete output channels
- Combinatorial logic to map multiple parameters to a single discrete output

Applications

- Provide discrete outputs based on backplane parameters, for example memory status; or output a voltage waveform, for example for a strip recorder

Overview

The KAD/DAC/001 can be used to output up to eight single ended waveforms, and provide up to sixteen discrete output indications. Outputs are short circuit protected (indefinite to ground).

The module is able to take any parameter from the backplane and, using a user-defined lookup table, map that parameter to the output voltage range of the analog output channel. A different map can be used for each of the eight analog channels.

Each of the discrete outputs can be set to a logic high or low based on a combination of input words. The input words are passed through a user-defined mapping function, which produces a single bit output. A typical example would be a max-min. window function to determine if a parameter lies in a defined range.

The outputs from the mapping functions can be either logically ANDed or ORed together, and inverted if required, in order to control the discrete output.

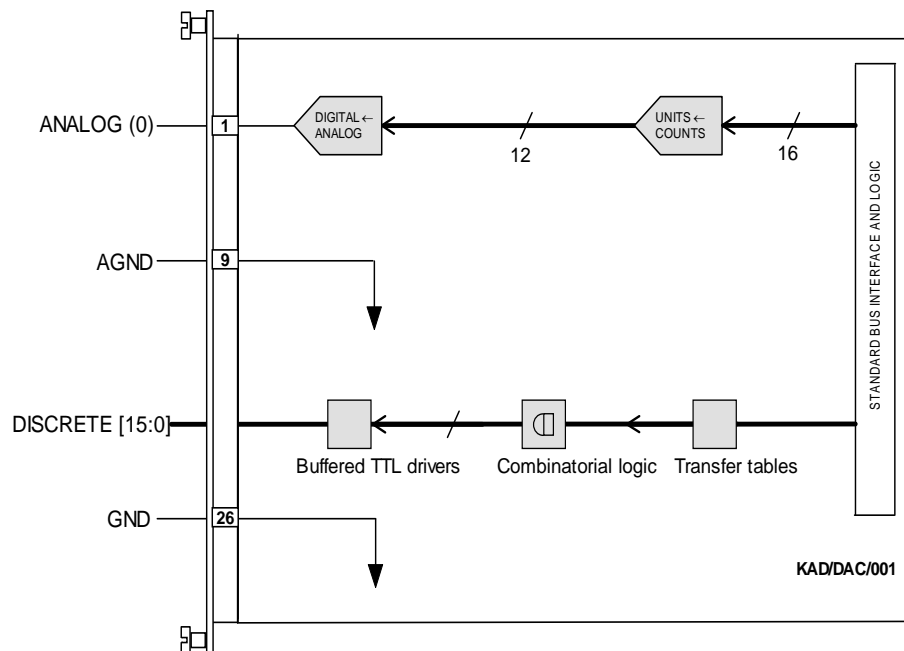


Figure 1: First of eight analog channels and the 16 discrete channels of the KAD/DAC/001

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	108	–	115	mA		
±7V	0	–	0	mA		
±12V	10	–	12	mA		
total power	0.78	–	0.86	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 Qualifications Handbook</i> .	
operating temperature	-40	–	85	°C	Chassis base/side plate temperature.	
storage temperature	-55	–	105	°C		

TABLE 2		Single ended DC voltage outputs				
PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS	
Outputs	–	–	8	–		
Update rate						
ANALOG	–	–	40	kbps		
Output voltage						
operating range	-10	–	10	V		
resolution	–	–	4.8	mV		
short circuit current	–	–	50	mA		
short circuit duration	∞	–	–	s	To GND.	
DC error	-40	–	40	mV		
Output resistance	–	–	200	Ω		

TABLE 3 B TTL outputs

PARAMETER	MIN.	TYP.	MAX.	UNITS	CONDITION/DETAILS
Outputs	-	-	16	-	
Update rate					
DIGITAL	-	-	40	kbps	
Output voltage					
logic 0	-	-	0.2	V	Sinking 0.1mA.
logic 1	4.8	-	-	V	Sourcing 0.1mA.
short circuit current	-	-	30	mA	
short circuit duration	∞	-	-	s	To GND.
Output resistance	100	-	-	Ω	

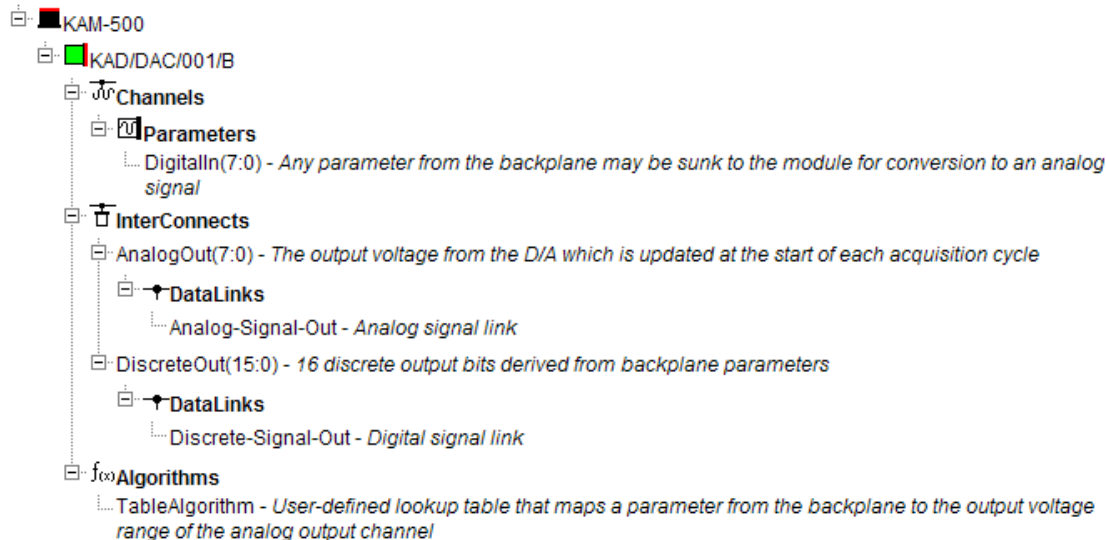
Setting up the KAD/DAC/001

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/DAC/001/B.

SETUP DATA	CHOICE	DEFAULT	NOTES
Manufacturer	-	-	-
Name	ACRA CONTROL	ACRA CONTROL	-
PartReference	KAD/DAC/001/B	KAD/DAC/001/B	-
SerialNumber	-	-	-
InterConnects AnalogOut(7:0)	No character limit	MyAnalogSignal	The output voltage from the D/A which is updated at the start of each acquisition cycle.
DiscreteOut(15:0)	No character limit	MyDiscreteSignal	16 discrete output bits derived from backplane parameters.
Settings	-	-	-
Module-Analog-Out-1.2	-	-	-
Channel DigitalIn(7:0)	-	-	-
Linearization	No character limit	MyTableLookupAlgorith m	Reference to a user-defined lookup table; a different map can be used for each of the eight analog channels.

Setting up parameters

Parameter definitions

The following table lists all parameters that are available for the KAD/DAC/001/B.

NAME/DESCRIPTION	BASE UNIT	DATA FORMAT	BITS	REGISTER DEFINITION
DigitalIn(7:0) Any parameter from the backplane may be sunk to the module for conversion to an analog signal	-	-	16	R[15:0] 0000:FFFF (hex)

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/DAC/001/B.

Non-programmable data links

NAME	DESCRIPTION
AnalogOut(7:0)	Analog signal link
DiscreteOut(15:0)	Digital signal link

Setting up algorithms

An algorithm describes how data should be processed. The following are algorithms supported by the KAD/DAC/001/B.

TableAlgorithm

User-defined lookup table that maps a parameter from the backplane to the output voltage range of the analog output channel.

SETUP DATA	CHOICE	DEFAULT	NOTES
ParameterTypeReference	-	-	-
Output	-	-	-
Entry		-	-
Input	65535:0	Not Specified	-
Output	10:-10	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/DAC/001

Each of the outputs is single ended. AGND and GND are connected internally on the module. However, it is recommended to use AGND for the analog output returns and GND for the discrete output returns.

The following table provides an example of how discrete outputs are defined when the appropriate modules are present:

TABLE 4	An example of discrete output definitions
D(15) ¹	Power-down glitch during last fastest output period
D(14)	EEPROM memory is full
D(13)	EEPROM memory is empty
D(12)	EEPROM memory is logging
D(11)	IRIG-B time is connected with no receive errors this acquisition cycle
D(10)	There have been no errors on any bus being monitored this acquisition cycle
D(9)	Parameter A is within the defined window
D(8)	Parameter B is within the defined window
D[7:0]	TBD

1. D(15) cannot be pre-configured.

The KAD/DAC/001 GUI does not support discrete output setup. However, settings can be configured via low level file management from the command line. To request instructions for configuring discrete output - TSR_U_029, contact Curtiss-Wright support (acra-support@curtisswright.com).

Connector pinout of the KAD/DAC/001

PIN	NAME	SEE SPECIFICATIONS TABLE	COMMENT
1	ANALOG(0)	Single ended DC voltage outputs	Analog output
2	ANALOG(1)	Single ended DC voltage outputs	Analog output
3	ANALOG(2)	Single ended DC voltage outputs	Analog output
4	ANALOG(3)	Single ended DC voltage outputs	Analog output
5	ANALOG(4)	Single ended DC voltage outputs	Analog output
6	ANALOG(5)	Single ended DC voltage outputs	Analog output
7	ANALOG(6)	Single ended DC voltage outputs	Analog output
8	ANALOG(7)	Single ended DC voltage outputs	Analog output
9	AGND	Internal ground	
10	DISCRETE(0)	BTTL outputs	Discrete output
11	DISCRETE(1)	BTTL outputs	Discrete output
12	DISCRETE(2)	BTTL outputs	Discrete output
13	DISCRETE(3)	BTTL outputs	Discrete output
14	DISCRETE(4)	BTTL outputs	Discrete output
15	DISCRETE(5)	BTTL outputs	Discrete output
16	DISCRETE(6)	BTTL outputs	Discrete output
17	DISCRETE(7)	BTTL outputs	Discrete output
18	DISCRETE(8)	BTTL outputs	Discrete output
19	DISCRETE(9)	BTTL outputs	Discrete output
20	DISCRETE(10)	BTTL outputs	Discrete output
21	DISCRETE(11)	BTTL outputs	Discrete output
22	DISCRETE(12)	BTTL outputs	Discrete output
23	DISCRETE(13)	BTTL outputs	Discrete output
24	DISCRETE(14)	BTTL outputs	Discrete output
25	DISCRETE(15)	BTTL outputs	Discrete output; MSB, indicates power-down glitch during fastest rate period
26	GND	Internal ground	
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	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	DNC		Do not connect
51	DNC		Do not connect
52	CHASSIS	Chassis	

Ordering information

PART NUMBER	DESCRIPTION
KAD/DAC/001/B	8-channel analog outputs with 16-channel discrete outputs

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/DAC/001/B	Improved output impedance	Recommended for new programs
KAD/DAC/001	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	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