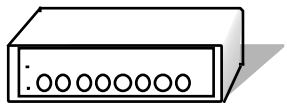
C.I.D.

ADIO-01

Analog and Digital Input and Output Module

ANALOG & DIGITAL INPUT/OUTPUT MODULE

Product Datasheet



The ADIO-01 is an universal peripheral that adds analog as well as digital input and output capabilities to a personal computer or other data terminals (DTE). Unlike other similar products on the market, the analog outputs of the ADIO-01 are capable of driving loads over 30 Watts per channel. The ADIO-01 contains state of the art electronic circuitry including a powerful microprocessor. Its low cost, rugged construction and flexibility make it ideal for a variety of applications in industry, education and home.
Built-in networking capabilities allow to connect a chain of up to 15 ADIO-01's to a single computer's RS232 port.

Product highlights:

- interfaces to a PC or Macintosh computer via standard serial port (no additional harware has to be installed into the computer)
- 8 dedicated analog/digital inputs
- 8 high-power analog outputs with read-back capability to drive motors, lamps etc.
- outputs can be paired for full bridge operation or paralleled for increased output power
- possibility of generating AC ouput waveforms on paired (and synchronized) outputs
- outputs use switching-mode (PWM) technology and are short circuit protected
- output ports can be reconfigured as additional inputs (giving a total of 16 input channels)
- input sensitivity can be adjusted by software (4 scales available)
- 2 uncommitted relay outputs (250V / 8 Amps)
- confortable 2-component connectors on all inputs and outputs
- power supply range: 11..28Volts DC (unregulated)
- large number of optional accessories are available
- software user interface programs for Windows95/98 and Macintosh are available, as well as C++ libraries and drivers for LabView™ (and other "scada" programs on request)

Ordering information:

Item	Ordering Code
ADIO-01 Module	ADIO-01C
External power supply (fits 1 or more ADIO's)	ADIO-PS
User program for Macintosh/Power Macintosh	GU-SWMAC
User program for PC (Windows95/98)	GU-SWWIN
Serial cable Macintosh - ADIO-01	C01-MAC
Serial cable PC - ADIO-01	C01-PC
Inter-module daisy-chain cable	C02-NET
LabView™ driver for Macintosh/Power Macintosh	LV-SWMAC
LabView™ driver for Windows95/98	LV-SWWIN
C++ source libraries (PC and Mac)	CPP-SW

For your orders please contact:

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Electrical characteristics:

Characteristic	Symbol	
Supply:		
Power supply range	Vcc	11 to 28 VDC
supply current when all outputs are off	Icc (Vcc=24V)	25 mA typ
Ouputs:		
Output voltage range	Vout	0 to VCC *)
Max continuous current sourcing/sinking per ch.	Iout	1.5 A rms
Peak current sourcing/sinking (200 ms) per ch.		5 A
Output ripple (DC mode)		< 180 mVpp
Output voltage resolution		6 bits
Output frequency (AC mode)	Fout	7.7 to 200 Hz
Output waveform (AC mode)		trapezoidal
Output voltage range (AC mode)		see fig 1 and 2
Short circuit protection on each output		yes
Thermal protection		yes
Dedicated inputs		
Input voltage range (scale 0)	Vin	-10 to +10 V
Input voltage range (scale 1)	Vin	-5 to +5 V
Input voltage range (scale 1)	Vin	-2 to + 2V
Input voltage range (scale 3)	Vin	-1 to +1 V
Input resolution		9 bits (8 bits + sign)
Max input sampling frequency †)	Fsample	35 Hz
Input protection circuits		yes
Disabled outputs used as inputs or reading back of enabled outputs		
Input voltage range (scale 0)	Vin	0 to 25 V
Input voltage range (scale 1)	Vin	0 to 12.5 V
Input voltage range (scale 2)	Vin	0 to 5 V
Input voltage range (scale 3)	Vin	0 to 2.5 V
Input resolution		8 bits
Max input sampling frequency †)		35 Hz
Input protection circuits		yes
Relay outputs		
power rating for each channel		250VAC, 8A
function (each)		SPST
Serial communication		
RS 232 protocol parameters		9600,n,8,1
Other protocols		contact factory
Dimensions		
w x d x h		235x165x60 mm

*) VCC can be internally measured. This allows to compensate power supply variations by software
†} With all inputs being used

Software Plug-Ins

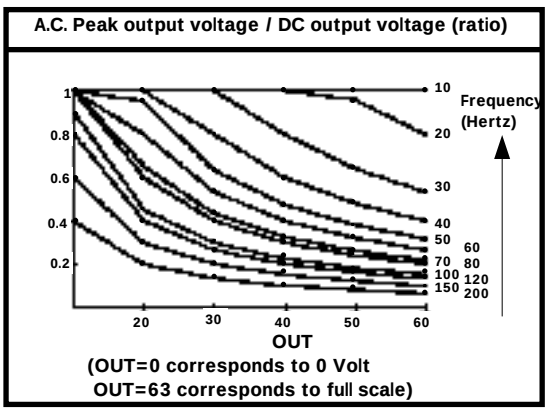
An internal non-volatile memory of the ADIO-01 can hold optional or custom software functions. These "plug-ins" can be automatically downloaded from your personal computer to the ADIO-01. Please contact us if you need any special software function.

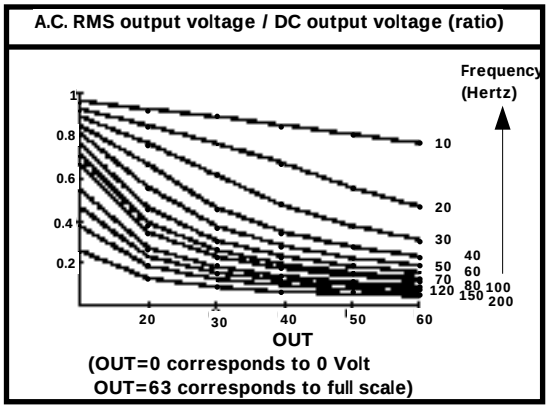
Four quadrant D.C. mode

The ADIO-01 is capable of driving a load in 4-quadrant mode. For this purpose, just connect the load across two outputs (full bridge operation) and operate the voltage of the two outputs as required.

A.C. mode

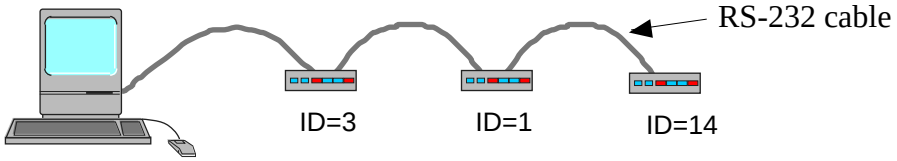
When switched to A.C. mode, the ADIO-01 automatically "modulates" its output voltage in order to generate a trapezoidal waveform that swings between 0V and the D.C output level that was present at that output before switching to A.C. mode. Of course, the amplitude of the A.C waveform can be modified "on the fly", just as it is possible to change D.C. output voltages.
When switching one output of the ADIO-01 to A.C. mode, the next nearby output is automatically switched to A.C. mode as well, with the same frequency and amplitude, but with half period phase shift.
A load which is then connected across the two outputs "sees" a true A.C. voltage, with no D.C. component (four quadrant full bridge operation). (Of course, loads can also be connected between one output and ground, if desired).
The two outputs are always and automatically phase locked together, even if the frequency or amplitude is changed. When switched back to D.C. mode, the two outputs become again independent.
It is possible to operate at the same time some outputs in D.C. mode and some others in A.C. mode.
The trapezoidal waveform generated by the ADIO-01 has the advantage to reduce harmonics. The rising and falling edges of the waveform have a fixed slew-rate (independent of frequency). Therefore, for increasing frequencies, the waveform can eventually become triangular and its RMS and peak value decreases as shown in fig. 1 and fig. 2 respectively.





Networking capabilities

The ADIO-01 has a particular communication protocol over the RS232 link, which enables up to 15 ADIO-01's to be chained (i.e. connected in a "daisy chain" manner) together, each one being separately addressable by the personal computer.
Each ADIO-01 is configured to have a different Address ID, by means of a rotary switch on the back panel.



Each ADIO-01 acts as a repeater (with zero delay!) for the downlink modules. This insures a reliable and interference free communication.
In addition, it is possible to mix other of our products into the same chain: for instance, a chain can be composed of 5 ADIO-01 and 8 DIGIO-01 (all are separately addressable by the computer). Inside the ADIO-01, a hardware expansion bay can accomodate adapters for other protocols. Actually, we are planning interfaces for: LON, RS485, USB, CAN (and others on request).