Introduction

The CNV-ALT accepts RS232 or Airtalk serial data from a compatible MGL Avionics instrument and produces parallel Gillham codes in a format compatible with mode C transponders.

1 Features

- **Accepts RS232 or Airtalk serial data from a MGL Avionics compatible instrument.**
- **Outputs parallel Gillham codes compatible with mode-C transponders.**
- **Red LED for status indication.**
- **Wide input supply voltage range of 8 to 30V dc with built in reverse voltage protection.**
- **Light weight design**
- **1 year limited warranty**

2 Specifications

Operating Temperature Range	-10ºC to 50ºC (14ºF to 122ºF)
Storage Temperature Range	-20ºC to 80ºC (-4ºF to 176ºF)
Humidity	<85% non-condensing
Power Supply	8 to 30Vdc with built in reverse voltage protection
Current Consumption	Approx. 15mA @ 13.8V (All output drivers off)
Enclosure Material	Anodized Aluminum
Enclosure Color	Black
Enclosure Dimensions	76mmx88mmx33mm (2.99"x3.46"x1.3")
Weight	Approx. 120 grams without cables
Output contact current rating	Open collector transistor switch to ground. Maximum rating 0.5A DC
RS232 Line Settings	9600 Baud, 8 data bits, no parity, 1 stop bit
RS232 protocol	MGL Avionics
Airtalk Line Settings	19200 Baud, 8 data bits, no parity, 1 stop bit
Airtalk protocol	MGL Avionics

3 Installation

The CNV-ALT produces inverted Gillham codes as required by virtually all transponders. The outputs are open collector types and will sink currents up to a few mA.

Connect the black and red wires to a suitable on-board power source. The voltage may be in the range from 8 to 30 volts dc. Connect the red wire to the positive supply (+) and the black wire to the negative supply (-).

Connect the RS232 or Airtalk output from the MGL Avionics compatible instrument to the CNV-ALT RS232 input or Airtalk input. Also connect the ground wire between the CNV-ALT and the instrument.

If using the RS232 input then please make sure that the serial protocol in the encoding instrument is set to the MGL Avionics protocol. The CNV-ALT will not operate with any other protocol selection.

The connection to the transponder consists of 10 or 11 connections, many transponders accept only codes A1 to C4, in this case you will leave signal D4 unconnected.

It is recommended to use shielded cable if a long cable is required to make a connection between the CNV-ALT and the transponder. The shield should be connected to ground at one point only (either on the CNV-ALT side or on the transponder side).

Installation of the wiring requires solder work. This needs to be done using electronic resin flux solder wire and proper temperature controlled soldering stations. Do not attempt this if you are unfamiliar with electronic soldering techniques. Please get professional assistance to do this. Bad connections can result in your transponder broadcasting incorrect altitude codes.

> **Please note:**
> Your country may have regulations that do not allow you to install a transponder or an encoding altimeter device yourself. The installation may have to be performed by an authorized person or company. Please check any applicable regulations with your aviation authorities.

Important information:

Depending on laws and regulations in your country you may not be allowed to install a transponder and associated equipment yourself. This work may have to be done by a certified AMO or instrument technician.

Please check with the relevant authorities.

The CNV-ALT is not certified equipment and may only be used in uncertified aircraft, home built aircraft and microlights (ultralights). Special operations permits for other aircraft may be required. Please be very aware that any wiring mistake related to the application of Gillham codes to your transponder will result in incorrect altitudes broadcast by your transponder. Any installation involving the CNV-ALT must be checked by a suitably equipped aircraft instrument maintenance outfit before operation. Failure to do this may be a criminal offense in your country.
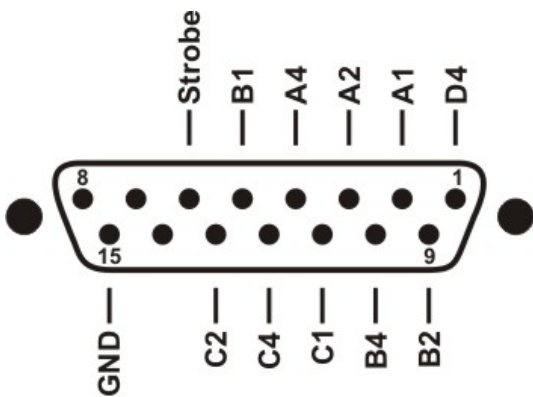
3.1 LED Status

Off – No power or the unit is faulty.
Steady on – The unit is not receiving valid serial data.
**Flashing** – The unit is receiving correct serial data and is producing Gillham codes.

3.2 CNV-ALT D15 Connection Diagram

The Gillham code signals are on the grey flat ribbon cable. Note that one side on the cable is marked with a red line to indicate pin 1.

D15 Pin	Function
1	Gillham Output D4
2	Gillham Output A1
3	Gillham Output A2
4	Gillham Output A4
5	Gillham Output B1
9	Gillham Output B2
10	Gillham Output B4
11	Gillham Output C1
12	Gillham Output C4
13	Gillham Output C2
15	Ground

3.3 CNV-ALT D9 Cable connections
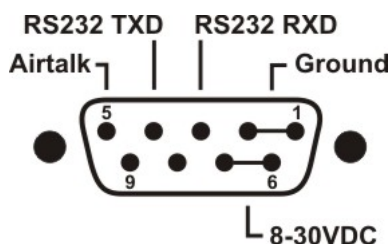
D9 Pin	Function
1,2	Ground
6,7	8-30Vdc Power
3	RS232 Input
5	Airtalk Input

3.4 Pinouts for various transponders

The CNV-ALT has a parallel output Gillham interface that can be directly connected to various parallel input transponders such as those from Garmin, Becker, King, Microair, etc. The output data contains the current pressure altitude with a fixed reference to 1013.25mB (29.92 inches mercury). The following table is of commonly used transponders and their Gillham code connections. Please consult your transponders installation manual on the physical position of every contact. Ensure that you wire the Gillham codes correctly and securely.
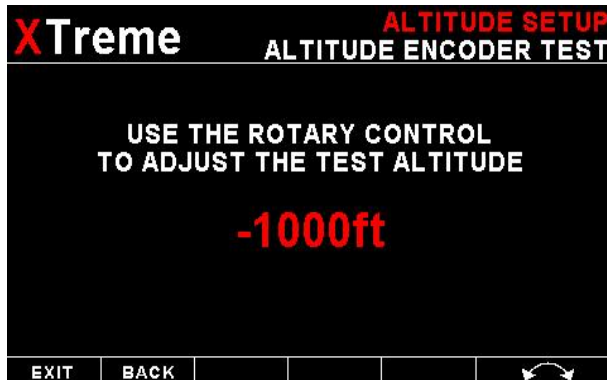
Transponder	A1	A2	A4	B1	B2	B4	C1	C2	C4
ARC RT359A/459A/859A	14	13	15	19	17	16	21	18	20
BECKER ATC 2000/3401	16	15	14	17	19	18	22	21	20
BECKER ATC 4401	1	2	3	14	15	16	17	18	19
BENDIX TRP-2060/2061/660	4	6	8	9	10	11	3	5	7
BENDIX TR541A/641B	A	B	C	D	E	F	H	J	K
COLLINS TDR-950/950L	12	10	7	6	5	4	8	11	9
EDO-AIRE RT-777	7	5	3	12	13	14	8	6	4
GARMIN 320/320A/327	3	5	6	9	11	12	10	4	7
GENAVE BETA 5000	4	5	6	7	8	9	10	11	12
KING KT76/78	6	7	9	4	1	2	3	8	10
KING KT76A/78A/76C/79	M	K	J	E	C	B	D	L	H
KING 750A	G	H	J	K	L	M	P	R	S
KING KT75	6	7	8	9	10	11	12	13	14
MICROAIR T2000	9	10	11	12	13	17	18	19	20
NARCO AT50/50A/150	7	6	8	12	10	9	14	11	13
NARCO AT5/6/6A	2	4	8	9	10	11	1	3	5
RADAIR 250	7	6	13	9	10	11	14	16	12
TERRA TRT250/250D	5	17	16	15	2	14	3	4	18
UPS/APPLLO SL70	13	31	12	33	14	32	16	34	15
WILCOX 1014A	K	C	W	T	L	D	P	F	Z

3.5 Codes in case of a failed serial data source

The CNV-ALT will switch all output drivers off if no valid altitude data has been received within 3 seconds. This is the same state as if the unit is not connected to the transponder or if the CNV-ALT is not operating due to not having been switched on.

3.6 XTreme-EFIS altitude encoder test function

Each altitude reporting code line must be tested for integrity of connection if at any time the aircraft connections to the transponder or altitude data source have been removed and reconnected. Integrity of the connections may be verified by performing a test of mode C function of the transponder system.

The XTreme-EFIS has a built in altitude encoder test function to test the installation between the XTreme-EFIS and CNV-ALT to the transponder.

The following codes are outputted:

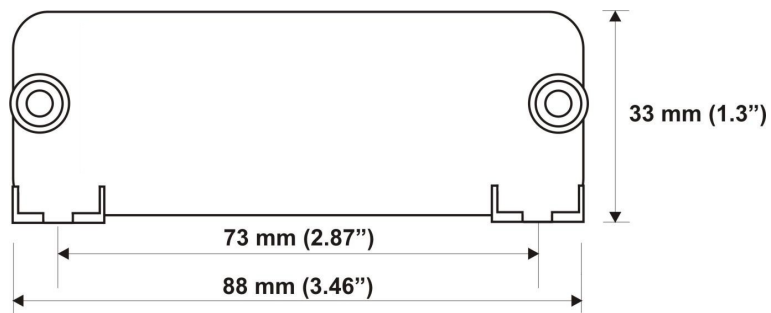| Altitude	D4	A1	A2	A4	B1	B2	B4	C1	C2	C4
-1000ft	0	0	0	0	0	0	0	0	1	0
-900ft	0	0	0	0	0	0	0	1	1	0
-700ft	0	0	0	0	0	0	1	1	0	0
-400ft	0	0	0	0	0	0	1	0	1	1
-200ft	0	0	0	0	0	1	1	0	0	1
800ft	0	0	0	0	1	1	0	0	0	1
2800ft	0	0	0	1	1	0	0	0	0	1
6800ft	0	0	1	1	0	0	0	0	0	1
14800ft	0	1	1	0	0	0	0	0	0	1
30800ft	1	1	0	0	0	0	0	0	0	1

4 Serial RS232 Altitude Encoder input

The CNV-ALT accepts RS232 data in the following format. RS232 line settings are 9600 baud, 8 data bits, no parity, and 1 stop bit.

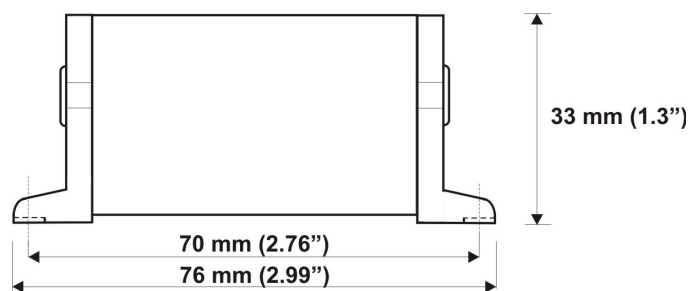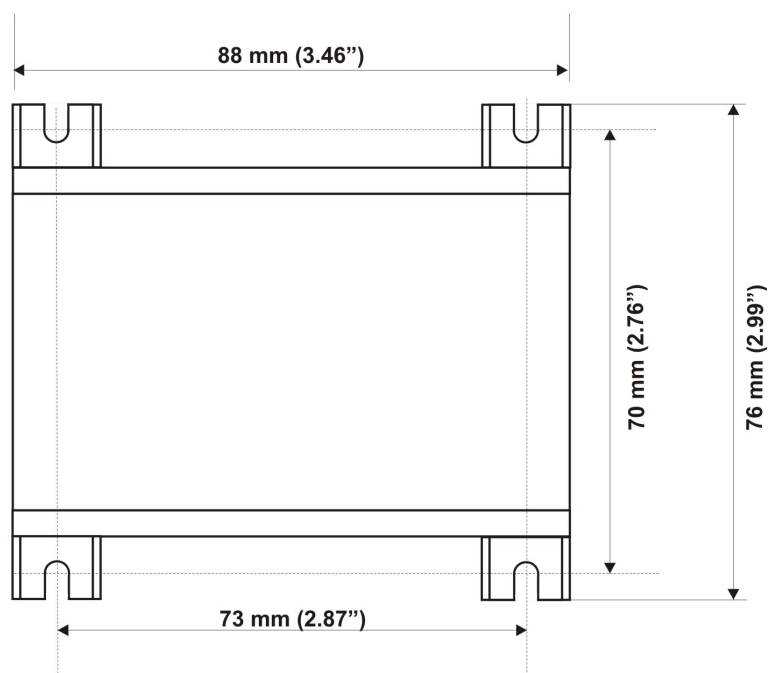| Protocol	Line Settings	Message format	Example
MGL Avionics	9600,8,N,1	ALT, +/-, five altitude digits right justified zero padded ,1013.25mB (29.92"Hg) referenced, C, +/-, five altitude digits right justified zero padded (corrected to local pressure), L, local pressure setting in millibars,+/-, four digit VSI reading right justified zero padded in ft/min, X, checksum, carriage return The checksum is a simple modulo 256 sum of the binary values of the individual characters. The checksum is sent as two characters in hexadecimal format	ALT+02372C+02372L1013+0000XCA[CR]
CR=0x0D			

5 Dimensions

FRONT VIEW

33 mm (1.3")

73 mm (2.87")

88 mm (3.46")

SIDE VIEW

33 mm (1.3")

70 mm (2.76")

76 mm (2.99")

TOP VIEW

88 mm (3.46")

70 mm (2.76")

76 mm (2.99")

73 mm (2.87")

6 Warranty

This product carries a warranty for a period of one year from date of purchase against faulty workmanship or defective materials, provided there is no evidence that the unit has been mishandled or misused. Warranty is limited to the replacement of faulty components and includes the cost of labour. Shipping costs are for the account of the purchaser.

> **Note:** Product warranty excludes damages caused by unprotected, unsuitable or incorrectly wired electrical supplies and or sensors, and damage caused by inductive loads.

7 Disclaimer

Operation of this instrument is the sole responsibility of the purchaser of the unit. The user must make themselves familiar with the operation of this instrument and the effect of any possible failure or malfunction.

This instrument is not certified by the FAA. Fitting of this instrument to certified aircraft is subject to the rules and conditions pertaining to such in your country. Please check with your local aviation authorities if in doubt. This instrument is intended for ultralight, microlight, home built and experimental aircraft. Operation of this instrument is the sole responsibility of the pilot in command (PIC) of the aircraft. This person must be proficient and carry a valid and relevant pilot's license. This person has to make themselves familiar with the operation of this instrument and the effect of any possible failure or malfunction. Under no circumstances does the manufacturer condone usage of this instrument for IFR flights.

> The manufacturer reserves the right to alter any specification without notice.