INTRODUCTION

The Model NC102 is a high stability sub-miniature (CTCSS) Encoder/Decoder engineered for tone squelch applications. The NC102 features small size, continuously field-tunable over entire frequency range, input/output mode selections, low current drain and uses a convenient mounting technique for quick field installations.

GENERAL

The Model NC102 has been engineered for maximum reliability. However, should you require technical assistance or detailed information, please contact our Customer Service Department at: (530) 477-8400.

SPECIFICATIONS

FREQUENCY ................ CONTINUOUSLY TUNABLE FROM 67 TO 250 HERTZ
FREQUENCY STABILITY ...... EXCEEDS EIA SPECIFICATIONS ±0.5%
BANDWIDTH ................ ±1.5% NOMINAL
OPERATING TEMPERATURE ... -20°C TO +80°C
OPERATING VOLTAGE ........ 5.5VDC TO 24VDC
OPERATING CURRENT ........ 3.5mADC
ENCODER OUTPUT ............ ADJUSTABLE 0 TO 650mVRMS (NO LOAD)
SINE WAVE DISTORTION ...... LESS THAN 1% (THD)
INPUT SENSITIVITY ........... 10mVrms TO 2Vrms
INPUT IMPEDANCE ............ GREATER THAN 50K Ohms
DETECT/DROPOUT TIME ...... 195ms/200ms NOMINALLY @135 HERTZ
CONTROLLED OUTPUTS ...... A) SINK=80mA @ 40VDC (OPEN COLLECTOR)
                           B) SOURCE=4.0VDC THRU SERIES 5.6K Ohm RESISTOR AND STEERING DIODE.
CONTROLLED INPUTS ......... A) ENCODER ENABLE
                           B) DECODER DISABLE
HIGH PASS FILTER ............ FOR ELIMINATION OF CTCSS TONE FROM RECEIVER AUDIO
SIZE ....................... 0.8” W x 1.5” L x 0.2” H
INTERFACE .................. MICRO-MINIATURE HEADER AND 12” COLOR CODED CABLE ASSEMBLY.
MOUNTING ................... DOUBLE SIDED ADHESIVE TAPE

--SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE--
INTERFACING

RED (+) .......................... Connect to +5.5VDC TO +24VDC
BLACK (-) ........................ Connect to system ground
GREEN [AUDIO INPUT] .......... Connect to receiver discriminator or high side of volume control.
   NOTE: Breaking the audio path at either of these locations is ideal for insertion of the high-pass filter.
   (Refer to violet lead)
YELLOW [ENCODER OUTPUT] . Connect to transmitter CTCSS input or at a point following all pre-emphasis, clipping or limiting circuitry. A series
   resistor may be necessary to eliminate input circuit leading due to the low output impedance of the encoder.
GRAY [ENCODE ENABLE] ...... The encode enable lead is factory jumpered to provide an encode output signal and activate the decoder's output
   circuitry when "HIGH" (Above ground). This lead is commonly connected to the microphone hang-up switch or hang-up
   button on back of microphone. If used in portable radio (Handheld) applications, then connect this lead to transmitter keyed "HIGH" circuitry.
   NOTE: To reverse this function, remove solder bridge jumper from JU4 pads.
BROWN [MONITOR ENABLE] ... The Monitor Enable lead is factory jumpered to activate the decoder's output circuitry when "HIGH" (Above ground).
   This lead is commonly connected to the monitor switch on the desk microphone of a base station or the tone/squelch
   switch of a portable radio to allow monitoring of the channel. If this lead is not used, it must be grounded or remove solder bridge jumper from JU5 pads B & C. NOTE: To reverse this function, remove solder bridge jumper from JU5 pads B & C and solder bridge jumper JU5 pads A & B.
ORANGE [SQUELCH CONTROL] The squelch control is factory jumpered to provide an output "LOW" (To ground) when the brown and gray leads are
   "LOW" (To ground). Upon detection of a valid decode tone, the output will go "HIGH" (Above ground) and enable the receiver's squelch circuitry. NOTE: (1) To reverse this function, remove solder bridge jumper from JU3 pads.
   (2) To source output, remove solder bridge from jumper JU2 pads.
VIOLET [HIGH-PASS FILTER .... Solder bridge jumper JU1 pads and remove "violet" lead when filter is to be connected in series with discriminates
   INPUT] or high side of volume control. NOTE: For receivers with separate provisions for use of high-pass filter, remove solder
   bridge jumper from JU1 pads and use the "HPF" (violet) lead for input and "HPF" (white) lead for output to receiver audio circuitry. This method provides an independent high-pass filter circuit for applications other than in series with detector output and decoder input. This filter is not intended for use in high level audio stages, such as speaker output.
WHITE [HIGH-PASS FILTER .... This output contains buffered audio with CTCSS tone frequencies removed. Connect this lead to remaining side of
   OUTPUT] broken audio path.
SPECIAL NOTE: Unless modified, the NC102 is factory jumpered as indicated above.

TUNING PROCEDURE

1. Tuning procedure must be made with Tone Board installed in the radio and with a dummy load connected in place of antenna.
   
   METHOD A
   Connect a frequency counter with 0.1Hz resolution to yellow lead on the tone board. Key transmitter and carefully adjust R32 multi-turn potentiometer to desired frequency.
   
   METHOD B
   Use a tone generator and an oscilloscope with an X-Y input to obtain a lissajous pattern on the scope. The tone generator must have a 0.1Hz resolution of
   the desired CTCSS tone frequency. i.e., if tone frequency desired is 100Hz, the tone generator should be set to 100.0Hz. Set the tone generator to the desired frequency and connect to the horizontal input of the scope then connect yellow lead on the tone board to the vertical input on the scope.
   Key transmitter and carefully adjust R32 multi-turn potentiometer to obtain a lissajous pattern.

2. Key transmitter and adjust R31 for approximately ±750Hz deviation as viewed on monitor scope or deviation meter.
FREQUENCY ADJUSTMENT
AND

MOUNTING:
The Model NC102 is supplied with a piece of double sided tape. Remove the protective covering from one side of tape and attach to bottom side of P.C. board. Now remove unit to desired location, making sure that mounting surface is clean and dry to insure positive mounting. For maximum protection from intensive R.F. fields and all leads be kept to minimum lengths.

COMPONENT LAYOUT

FREQUENCY/DEVIATION

Frequency adjustment is easily performed by operating the unit as an encoder. With JU4 jumpered, unground the + side with a frequency counter. Adjust R1 for desired tone frequency. Key transmitter and adjust R4 for scope or deviation meter.
NorComm products are unconditionally guaranteed for two (2) years on materials and labor from date of purchase.

All Warranty repairs must be performed at NorComm's Customer Service Department in Grass Valley, CA. Units under warranty can be returned for repair or Purchaser's authorization for NorComm to repair or replace equipment and to invoice Purchaser for any and all reasonable costs of repair labor, parts and freight.

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