

INSTRUCTION

MANUAL

DUAL COUNTER TIMER



TYPE : CT 542A

NUCLEONIX SYSTEMS PRIVATE LIMITED

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CHAPTER - I

INTRODUCTION

Dual Counter Timer (AT) CT 542A manufactured by NUCLEONIX is designed around a microcontroller chip and has 16x 2 LCD dotmatrix display.

This unit can be used in three modes PRESET SCALER, CPS & CPM modes. It has on board memory to acquire readings upto 1000. The stored data readings can be recalled onto display or can be printed onto the printer. It can count two inputs simultaneously.

This unit has a built-in parallel port (centronics) and a serial port RS 232 for connecting to a PC.

It is built as a two bit module. It can count both positive and negative pulses in the range of 100 mV to 10V and upto a maximum frequency of 1MHz. LCD display indicates preset and elapsed time and counts of any selected channel.

Programmability of 1, 2 & 4 iterations for any particular counting.

Important features of this unit are :

- p Microcontroller based state-of-art counter/timer
- p Modes : Counting for preset time, CPS & CPM
- p Display on dotmatrix LCD for counts, elapsed time / preset time
- p Store/recall facility for 1000 readings
- p Built-in parallel port for printing data
- p Built-in serial port for PC communication
- p Counts two inputs simultaneously

CHAPTER - II

FRONT PANEL & REAR PANEL CONTROLS

2.1. FRONT PANEL CONTROLS AND INDICATIONS

2.1.1. POLARITY SWITCH

Positive & Negative : Selects the polarity of the input signal for counting.

2.1.2. INPUT

There are 2 individual (labelled 1 to 2) BNC connectors which receive the input pulses to be counted.

2.1.3 INTELLIGENT KEY PAD

- (a) PROG key button : This key is an important one which facilitates the user to programme the operation of the instrument for different modes / conditions. More details are covered under section "Instructions on Intelligent keypad commands".
- (b) START key button : This is used for starting of acquisition and printing, once all the programme parameters have been set.
- (c) STOP key button : This key can be used to terminate acquisition and printing inbetween. In the normal course acquisition will stop automatically at the end of preset time and the data printing will stop once the end serial number setting for printing has reached.
- (d) INC/DEC key button : These keys are used while setting the program parameters to increment and decrement a value or to change the option selected to another value available.
- (e) STORE key button : This key is used for storing the readings or data values in the following way, in the manual mode of storing only.

At the end of acquisition for a preset time if user presses this button, data counts will be stored and the sl.no. in the display increments to the next value.

In CPS/CPM modes the current CPS/CPM is saved on pressing this button.

2.1.4. LCD DOTMATRIX DISPLAY

This is a 12 X 2 alpha numeric LCD dotmatrix and responds to all the commands from the keypad and displays programme parameters, data counts, preset and elapsed times etc.

2.2. REAR PANEL CONTROLS AND INDICATIONS

2.2.1. TO PRINTER : This is a 25 pin D-female connector through which one can connect a printer (with centronics interface cable) for direct printing of data.

2.2.2. SERIAL PORT (RS232) : This is a 9 pin D-female connector having RS232 compatible signals for serial data communication to a P.C. Under software control from a PC, the stored data readings from this unit can be downloaded into PC. (Software can be supplied at extra cost)

FRONT PANEL VIEW



REAR PANEL VIEW



CHAPTER - III

SPECIFICATIONS

Count Input(s) IN1 & IN2	:	100mV to 10V, unipolar or positive bipolar semi-gaussian pulse
Pulse Width	:	0.5 micro sec (min)
Polarity	:	Positive or Negative
Input Impedance	:	1.0 K ohms
Input Counts Capacity	:	999999 counts
Input Frequency (max)	:	1 MHz
Pulse Height Discrimination	:	100mV - 10V by a trimpot provided (inside) on PCB
Counts Indication	:	12 x 2 dotmatrix LCD display
Modes of Data Acquisition	:	a. Counts for a preset time b. CPS c. CPM
TIMER: Preset Time Setting	:	Programmable through tuctile switch control buttons
Control Buttons	:	START, STOP, PROG, STORE, INC, DEC
Preset Time/Elapsed Time Indication	:	On 12 x 2 LCD Dot matrix display
Preset Time Range	:	1 to 9999
Printer Port	:	Built-in
Serial Port	:	RS 232C built-in
Additional Options:(at extra cost)	:	a. Data communication Software for down loading of data can be given at extra cost. b. Ext. hand held keypad with cable. c. Printer.

CHAPTER - IV

4.1. OPERATING PROCEDURE

INTERCONNECTIONS & HOW TO POWER ON THE UNIT

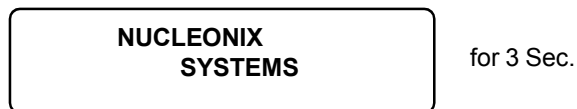
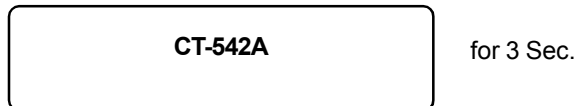
This unit is a two bit module and is designed to work on BIN power supply.

1. There are two input BNC's, user can connect required number of inputs and acquire counts in the required mode of operation. [refer to chapter IV (4.2)]
2. The data acquired can be stored, recalled back on to display, printed or downloaded into PC for later processing.
3. Required cables from printer port to printer or serial port to PC can be connected depending upon the need.
4. For data downloading into PC a separate Data communication software is provided at extra cost.

S.No.	Cable Name	Connections	
		From	To
01.	BNC to BNC signal Cable(s)	Signal outputs to be counted	CT542A IN1 & IN2
02.	Serial Port Cable	PC serial port	CT542A RS232 (9 pin D on Rear Panel)
03.	Printer Cable	Inkjet Printer	CT542A TO PRINTER (centronics connector on Rear Panel)

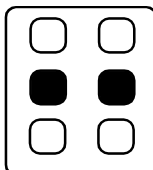
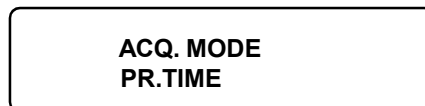
4.2. INSTRUCTIONS ON INTELLIGENT KEYPAD COMMANDS

When we switch on the unit, the display will show up,



4.2.1. ACQUISITION MODE SELECTION

By default, display changes to,

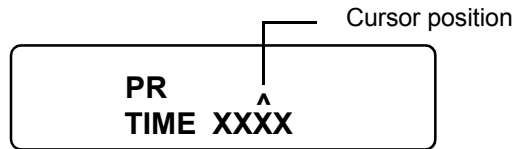
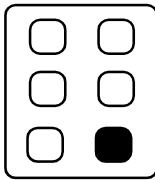


This signifies that by default "acquisition is in preset time mode". Because in majority of the situations counting is done for a preset time set.

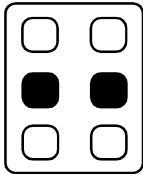
If you want other modes of acquisition such as CPS (Counts per second) or CPM (Counts per minute) then press t or s keys to select required mode or else proceed as follows. If ACQ MODE required is PR. TIME then, skip the above selection and proceed as given below.

4.2.2. PRESET TIME SETTING

By pressing PROG key, display changes to,



This displays the previous preset time for counting. We can change the preset time by the following way.



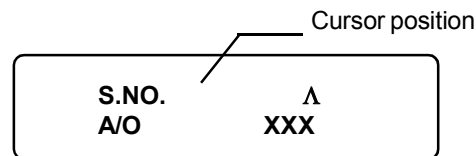
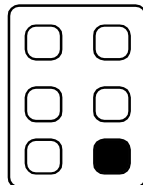
s Key can be used to increase the value at the cursor position.

t Key can be used to shift the cursor position to the left.

By the above method set the required PRESET TIME for acquisition.

4.2.3. SETTING OF STARTING SL.NO. OF 'DATA READING' FOR ACQUISITION AND OUTPUTTING TO DISPLAY / PRINTER

Now by pressing PROG key again display changes to,



A/O :

Acquisition & outputting to recall, store and print from this serial number.

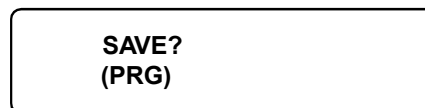
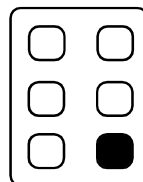
XXX:

This displays the current serial number for storing and to recall data readings. We can change serial number by similar method, as explained under preset time setting.

4.2.4. SAVING PROGRAMMED PARAMETERS

All the programmed parameters are to be saved by the user before he can start acquisition. Without saving, the system will use the previous parameters for acquisition.

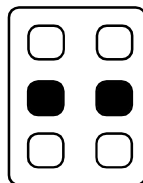
By pressing PROG key, display changes to,



SAVE?

To save the above parameters press s or t keys

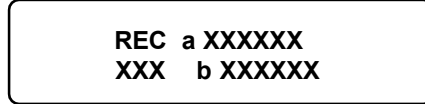
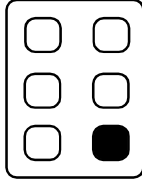
"OK" will be displayed on saving of parameters.



4.2.5. RECALL DATA READINGS

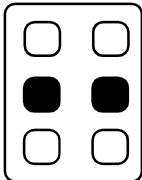
This is a very useful feature that has been provided in this unit. At the end of storing/saving of a set of readings, this feature will enable the users to recall the readings on to the display, from the SI.No. set in the "RECALL" mode. Changing of the SI.No. is similar to that explained under "PRESET TIME" selection.

By pressing PROG key, display changes to,



REC
XXX:

This displays current SI. No. from which data is recalled.



a & b XXXXXX:

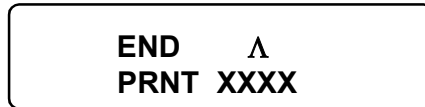
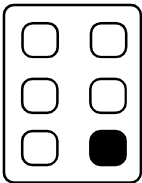
This shows up the counts in channel a & channel b.

Recall serial number can be changed by *s* or *t* keys.

4.2.6. END SL.NO. "DATA READING" FOR PRINT OPTION

This option facilitates the users to set the end limit for printing of data readings. Starting point SI.No. for the printing is set as explained under 4.2.3.

By pressing PROG key, display changes to,



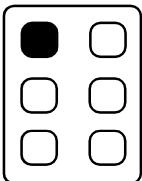
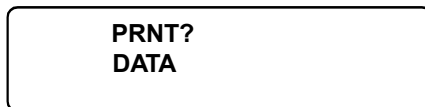
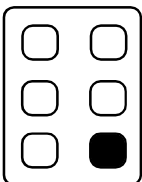
XXXX : This is the last number to be printed, starting number can be selected from SI.No. setting.

4.2.7. PRINT COMMAND FOR DATA READINGS PRINTING

After setting the limits for SI.No. both for start & end, printing can be carried out by invoking this command. Ofcourse it is assumed that a **centronics interface compatible printer** has been connected to this counting system through a cable.

A sample print out is enclosed in the following page.

By pressing PROG key, display changes to,

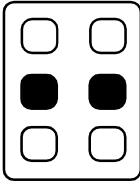
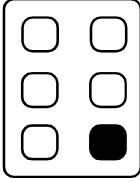


Press START to print the data. Starting number can be selected by SI.No. setting, last number can be selected by
END
PRINT ?

4.2.8. ITERATION PROGRAMMABILITY FOR A READING

Iteration programmability is another useful feature that has been provided. Sometimes user may like to iterate a reading 2 or 3 times. The system allows this and it displays averaged reading only, at the end of two or three iterations. Acquisition for iterations once initiated will go till all the iterations are completed. Users intervention is not required.

By pressing PROG key, display changes to,



X: By default '1' is displayed. Number of iterations can be changed to 2 or 4 by using *s* or *t* keys.

4.2.9. STORING OF DATA READINGS

This system has CMOS memory to store upto 1000 readings. Storing can be initiated in two ways.

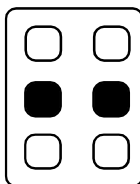
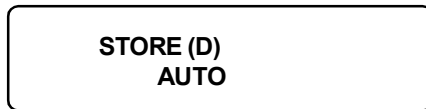
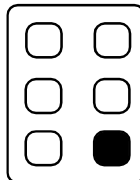
- (a) MANUAL (b) AUTO

User can select any of these options. In manual mode at the end of acquisition of each reading the user has to press "STORE" command button once for each reading.

In AUTO mode, each of the data readings gets saved into memory along with lable. User intervention is not required.

While acquisition is going on, user may observe that at the end of each acquisition, the SI.No. pointer will be incremented by one where the data counts will be stored.

By pressing PROG key, display changes to,



Default mode is AUTO, to change to manual mode press *s* or *t* key. AUTO mode is used to store data automatically after acquisition (PR. TIME).

Note : In case of CPS/CPM mode press STORE to store data at any time. AUTO storing is not valid in CPS/CPM mode.

4.2.10. DATA ACQUISITION BY PRESING START BUTTON

Once the user presses 'START' at the end of saving of programmed parameters, user will see a display as,

ET A a XXXXXX YYYY b XXXXXX

ET indicates elapsed time

A - Blinks

"A" stands for Acquisition and blinks during acquisition and disappears at the end of acquisition. The counts will get stored at the particular SI.No. if STORE(DATA) mode is in AUTO condition. If the STORE(DATA) is in manual mode, the counts acquired can be stored by pressing STORE button. The count will not be stored if START button is pressed again. Hence this can be taken as fresh iteration.

Menu	Options
ACQ mode	Pr. Time CPS CPM
Preset Time	---
Save? (PRG)	OK / skip
Recall	---
END NO. (PRINT)	---
PRINT DATA	---
ITERATION	1 / 2 / 4
STORE DATA	AUTO MANUAL

4.3. OPERATING PROCEDURE

User is advised to read the Chapter IV - 4.1 & 4.2 which clearly deal with the required information on how to power ON & use the instrument.

Information covered under 4.1 & 4.2 gives complete operating procedure and hence no separate information is provided here.

CHAPTER - V

PC COMMUNICATION (OPTIONAL)

Serial Data Communication software for downloading data from Dual Counter Timer to PC can be provided separately at extra cost. Necessary instructions for using this software will be provided along with the software.

CHAPTER - VI

BLOCK DIAGRAM & DESCRIPTION

From the block diagram of Dual Counter Timer Unit it can be seen that this unit to be plug into BIN power supply. The following low voltages namely +12V and -12V are supplied by standard BIN power supply to power.

There are two independent I²C bus compatible counter chips connected to shorted ports of microcontroller. Each counter chip is initially programmed through microcontroller for operation in counter mode.

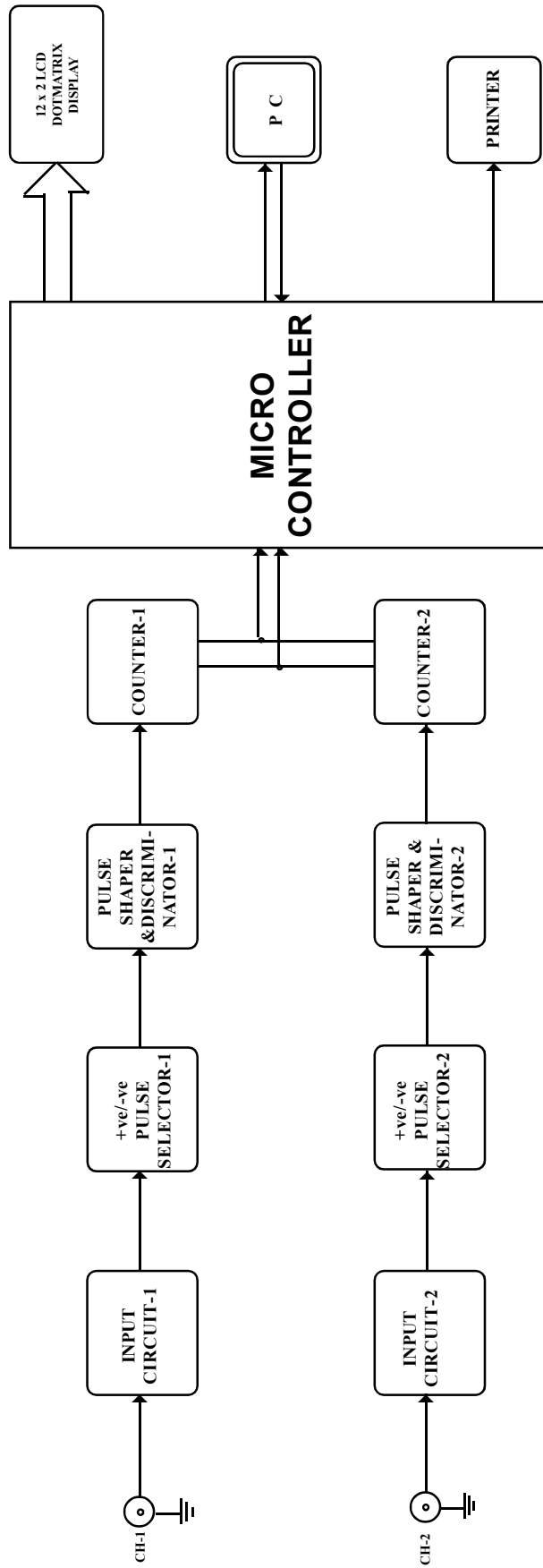
There is a common gating control through a port for generating timer output which allows counting for the selected preset time.

There are two independent EEPROM chips connected through common port for storing the data counts for each of the respective channels. These EEPROM chips are also I²C bus compatible.

There is a 12 x 2 LCD dotmatrix display which is interfaced to the microcontroller to showup two channel data counts data, programming features and other options on the display.

A six command keypad acts as an interfaced for the user to program the Dual counter Timer and operate it accordingly. The other interfaces provided include parallel port for connecting to an inkjet printer for data printing and a serial port for connecting to a PC for serial communication and data downloading under software control.

**BLOCK DIAGRAM OF DUAL COUNTER TIMER
TYPE : CT542A**



CHAPTER –XV

CONTACT US FOR AVAILING SERVICES

Postal/Mailing Address (Phone / Fax / Email)

Nucleonix Systems Pvt Ltd.
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Fax : + 91-40 - 27262146
Email : info@nucleonix.com

**For any information, Contact by email is always appreciated.
(This will help us to respond to you quickly)**

Marketing Department :

a) Sales / Commercial Information / Field installation and servicing

For any Commercial, Price information, Product information, customer coordination & quotation

of our products customer related commercial services, please contact front office marketing staff through the listed Email Ids or Phone Nos. given below

Whom to Contact:

Business Executives:	Contact Numbers	Contact by E-mail ID
1.U.Sulochana (Sr. Business Executive)	Mob:7331104481, Ph-040-27263701	info@nucleonix.com
2. R.Maniram (Business Executive)	Mob:7331104481, Ph-040-27263701	info@nucleonix.com
3. Ch.Gayatri (Business Executive)	Mob:7331104481, Ph-040-27263701	info@nucleonix.com

Note: Our business executives will also connect you to concerned Engineer or General Manager for any technical clarifications if required

b) Factory Services

For **Servicing and Calibration** factory services & follow up on the above jobs including dispatch related/payment related issues of serviced & calibrated items please contact

Ms.B.Sravani
(Executive services)

Mob:7331104482

E-mail: info@nucleonix.com

She will also connect you to concerned engineer or general manager if required, for any clarifications & deficiencies in services

c) Dispatch Related Issues (Production Items)

For dispatch related issues of your ordered equipments, including delays, purchase order related document deficiencies, payment proofs, dispatch docket details and bills etc.,contact

Ms.V.Anusha / Renuka
Devi (Executive Dispatch)

Ph:040-27263701, Ex-26

E-mail: info@nucleonix.com

d) Product Technical Information / Clarifications

Whom To Contact:

Contact any front office "Business Executive"- He/She will take your details and connect you to concerned product engineer for any technical clarifications. Best thing is to email your technical queries and obtain the reply, rather than on telephone.

You can also contact General Manager or Director (Tech) if required.

e) Marketing Manager

On business matters for all your marketing services / techno commercial requirements about Nucleonix Products contact:

Bhaskara I.V.

Mob:8019662500

Land lines : 91-40-27263701, 91-40-68888777

Email: info@nucleonix.com

f) General Manager

Dr.M.S.R.Murthy PhD (Nuclear physics)

Land line: 91-40-27263701, 91-40-68888777

Email: info@nucleonix.com

Contact General Manager for all sales / servicing and technical information including customer support related issues, on the delays, gaps & lapses by our staff. Contact G.M. regarding field installations & field servicing jobs schedule etc.

g) H.R -Incharge

Contact her regarding, job vacancies, sending resume for employment, H.R. related issues etc. contact

Ms. M.Swarna Jyothi

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Email: recruit@nucleonix.com

h) Director -Technical

Mr. J. Dheeraj Reddy

Email: jdreddy@nucleonix.com

Mobile No :+91-7674009005

Contact him for, any Technical Information and clarifications on products, which cannot be answered by General Manager / Customer support executives.

For any technical deficiencies in products, related issues & suggestions on product improvements you may contact by email or telephone. This will help the company to improve the product & serve you better.

Dealer's complaints, on commercials, lapses by our commercial staff, or any other discrepancy, or you like to give any feedback on any Nucleonix staff doing any wrong thing against cleaner / ethical business principles / practices can be complained to any of the directors or managing director.

i) Director - IT

Mr. J. Nishanth Reddy

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Mobile No. +91-9966691000

For any deficiencies in product software's, related issues, & any suggestions or improvisations in software's can be contact by email or telephone. This will help the company to improve the product & serve you better.

j) Managing Director

Shri. J.Narender Reddy (Managing Director)

Email : jnreddy@nucleonix.com; info@nucleonix.com

Contact Managing Director for, Foreign relations, International Business co-operation, Joint ventures, Exports, Dealership in other countries, Policy matters, Technology tie-ups etc.

k) Dealers Complaints :

Dealers complaints, on commercials, lapses by our commercial staff, or any other discrepancy, or you like to give any feedback on any Nucleonix staff doing any wrong thing against cleaner / ethical business principles / practices can be complained to any of the directors or managing director.

**An innovative company working towards excellence
in the field of Nuclear Instrumentation**



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