

**8CH COUNTER/TIMER**

**NCT08-02**

**USER'S MANUAL**

**2766 (rev 3.)**



APPLICATION OF ELECTRONIC DEVICES

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NCT08-02 COMMAND TABLE (To: LAN, USB)

COMMANDS	CONTENTS OF COMMANDS	DETAILS OF COMMANDS
ALM ?	alarm read	inquiry the contents of overflow
CLAL	clear all	clear timer and 8 channel counters
CLPC	clear preset counter	clear preset counter (CH7)
CLTM	clear timer	clear timer
CLCTxx	clear counter xx	clear counter channel xx   xx:00-07
CLCTxxyy	clear counter xx to yy	clear counter channel xx to yy   xx, yy:00-07
CPR ?	counter preset data read	read preset count value reply 8 digit number in decimal (unit Kcts) (example:00010000)
CPRF ?	counter preset data read	read preset count value reply 8 digit number in decimal (unit cts) (example:00010000)
CTR ? xx	counter xx read	read channel xx count value   xx:00-07 reply 10 digit number in decimal
CTR ? xxyy	counter xx to yy read	read channel xx to yy count value   xx, yy:00-07 reply 10 digit number in decimal space separated data
DSAS	disable auto stop	disable to automatically stop (It means count on until STOP command)
ENCS	enable counter stop	enable to counter stop
ENTS	enable timer stop	enable to timer stop
MOD ?	mode read	inquiry the mode
RDAL ?	read all counter and timer	read all counter and timer
SCPRdddd••••	set counter preset data	set preset data to counter (unit Kcts)
SCPRFdddd••••	set counter preset data	set preset data to counter (unit cts)
TPR ?	timer preset data read	read preset timer data (unit ms)
TPRF ?	timer preset data read	read preset timer data (unit $\mu$ s)
STOP	stop counter	deactivate counting action
STPRdddd••••	set preset counter to dddd••••	set preset timer value (unit ms)
STPRFdddd••••	set preset counter to dddd••••	set preset timer value (unit $\mu$ s)
STRT	start counter	start counting action
TMR ?	timer read	read timer value
VER ?	version information read	read firmware version information
REST	reset and start	set the unit restart (It's same as power on sequence)
FROM?	using ROM number read	read program ROM number inside
FROM0, FROM1	choose ROM	set program ROM number to activate
		It's valid after RESET or power on sequence.
FLG?x	read internal flag	read internal state flag inside

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# NCT08-02 User's manual

## 1. Specifications

### 1-1. Abstract

This unit has fast eight channel 48 bit counters and a 40 bit timer.

It counts during timer set interval or until the limited set count value.

Setting interval for count is  $1 \mu s$  to 1,099,511.627775s. Setting limited count value is 1cts to 281,474,976,710,655cts. \*1)

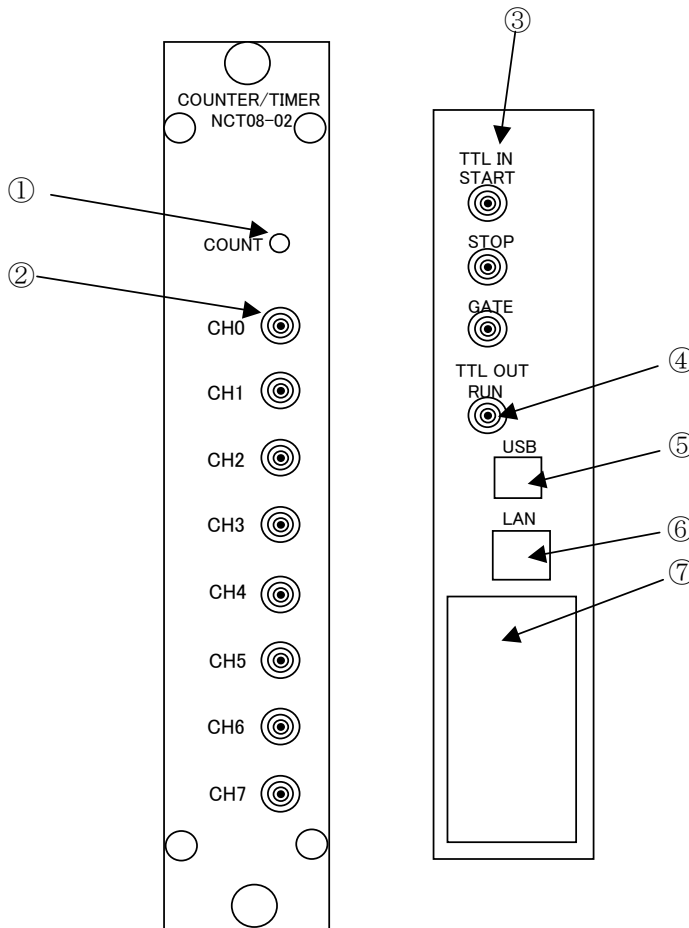
This unit is assembled in a NIM 1 unit case. By connecting several units by RUN-GATE connection, total count channels can be increased to  $8 \times n$  channels.

It's possible to control by LAN or USB communication.

The NCT08-02 is made as an upgrade model of NCT08-01. The commands are almost the same of the NCT08-01.

\*) The preset value is round down to multiple number of eight.

### 1-2. Appearance



① It shows the beginning of count action. LED "ON" means the counter gate open.

② Input count connectors. There are CH0 to CH7. (INPUT)

It's possible to set preset value only for CH7.

③ Connect TTL level signal (3.3 - 5V) from external unit.

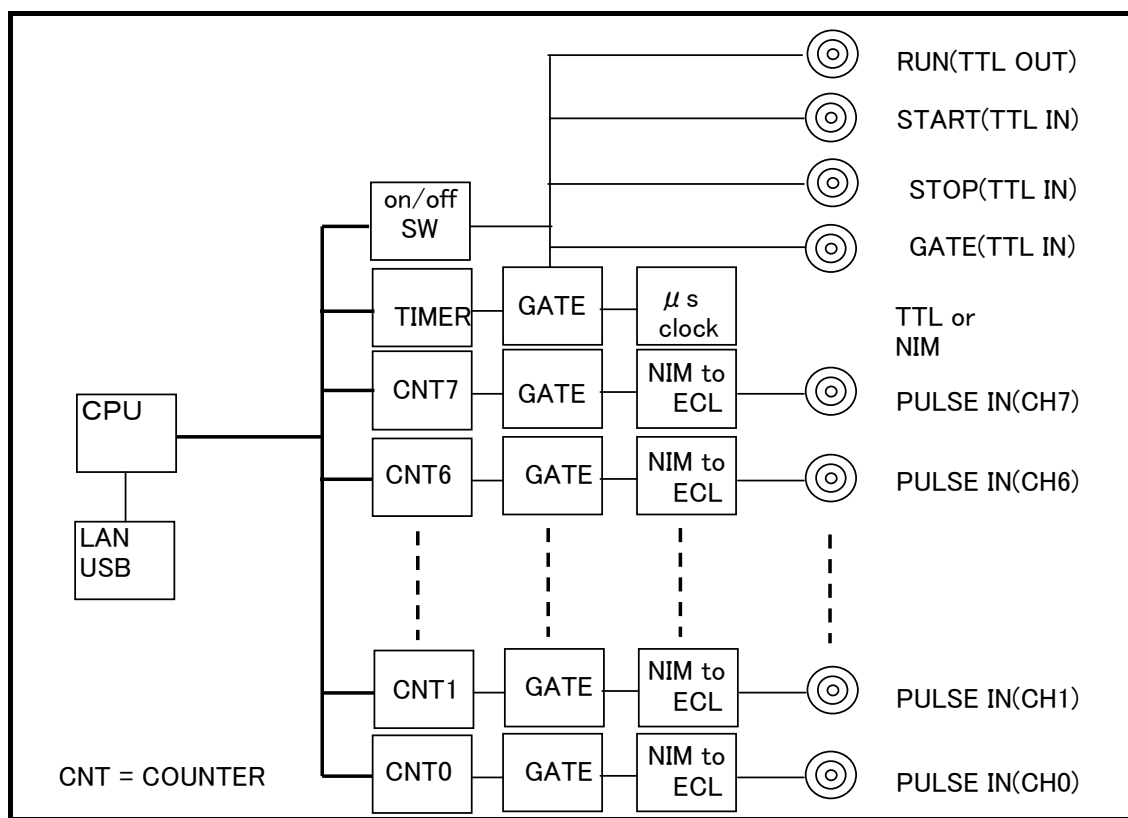
START: When upward edge signal is "ON" ("H"), it starts counting. (INPUT)

Normally (not connected) START signal is "L".

When count mode is selected to "Counter 07 stop" or "Timer stop" and count value or timer value goes on limit, START can't become true.

- STOP: When upward edge signal is "ON" ("H"), counting action stopped. (INPUT)  
Normally (not connected) STOP signal is "L".
- GATE: When GATE signal goes "L", count action stopped during "L" level. (INPUT)  
When it goes "H", count action starts again.  
Normally (not connected) GATE signal is "H".
- ④ When this unit is in counting action, output signal goes "H".  
When connect this one to another unit's "GATE" port, 16 channels counter can be started or stopped simultaneously, only by upper unit control.
- ⑤ This one is USB port.
- ⑥ This one is ETHERNET (LAN) connection port. It's adapted to 10BASE-T,100BASE-T connection.
- ⑦ This one is NIM connector. Power source is provided from this connector.

### 1-3. Block diagram



## 2. Before using

### 2-1. Confirm input signal level for count

Input count signal level is fixed to fast NIM level for each channel.

Please confirm the signals are between the permitted level. (-12mA ~ -36mA: "1" -4mA ~ +20mA: "0")

The input impedance is 50Ω, so the voltage level will be -0.6V ~ -1.8V : "1" and > -0.2V : "0".

### 2-2. Setting LAN communication

#### 2-2-1. Preparation for setting

To control this one by LAN communication, it's need to some setting items by 10Base-T/100Base-T communication cable. Setting protocol is telnet protocol by TCP/IP connection.

To connect network by this one, IP address, subnet mask, and Port NO must be set to this unit.

Factory default is "IP address is 192.168.1.55", "sub net mask is 255.255.255.0" and "Port NO is 7777"

When connecting PC directly, it's need to use cross cable. Otherwise using HUB module, it's no need to use cross cable.

The way of connecting PC directly is as follows.

It's need to set IP address and subnet mask to your PC.

Set IP address to 192.168.1.10, and subnet mask to 255.255.255.0, for example.

about the way of setting address to your PC, see your PC manual.

Select MS-DOS prompt and access command "ping" in MS-DOS prompt.

```
C:\Windows>ping 192.168.1.55
```

```
Pinging 192.168.1.55 with 32 bytes of data:
```

```
Reply from 192.168.1.55: bytes=32 time=2ms TTL=255
```

```
Reply from 192.168.1.55: bytes=32 time=1ms TTL=255
```

```
Reply from 192.168.1.55: bytes=32 time=1ms TTL=255
```

```
Reply from 192.168.1.55: bytes=32 time=1ms TTL=255
```

```
C:\Windows>
```

If replies are listed above, physical connection is correct.

If physical connection is not correct, communication replies are these.

```
C:\Windows>ping 192.168.1.55
```

```
Pinging 192.168.1.55 with 32 bytes of data:
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
Request timed out.
```

```
C:\Windows>
```

In this case please retry the connection again after confirming the cable connection.

## 2-2-2. Changing setting condition for net-work

Once you check connection is correct, enter new IP address and new telnet port NO of NCT08-02.

(If default NO is OK, you don't have to do this operation.)

Default IP address is 192.168.1.55, and default port NO is 7777.

IP address must to be changed according to your network system.

If there is no need to change port NO, you may use NO 7777.

If you need to change port NO, the recommended port is NO. 10000 to 10999.

In Windows screen display

START → Specify the file name and run, file name is

telnet 192.168.1.55 9999

NO 9999 is port set number of NCT08-02.

Click OK button and screen changed to telnet mode immediately.

MAC address 00204A80F1B6 ← It depends on the type of unit.

Software version 01.5(031003)XPTE ← It depends on the type of unit.

Press Enter to go into Setup Mode

Push Return button in 3sec.

More than 3 sec, this connection is automatically cut off. Then try again from beginning.

Next display

.....

Change Setup:

- 0 Server configuration
- 1 Channel 1 configuration
- 3 E-mail settings
- 5 Expert settings
- 6 Security
- 7 Factory defaults
- 8 Exit without save
- 9 Save and exit                      Your choice ?

Then select 1.

- Baudrate(38400) ?            ..... push return.
- I/F Mode(4C) ?            ..... push return.
- Flow(00) ?                ..... push return.
- Port No(7777) ?            .....enter port address of telnet, then push return  
(Default port NO is 7777, if you need to change this number,  
recommended port number is 10000 to 10999.)
- ConnectMode(C0) ?        ..... push return.
- Remote IP Address:(000).(000).(000).(000)..... push return three times.
- Remote Port (0) ?        ..... push return.
- DisConnMode(00) ?        ..... push return.
- FlushuMode (80) ?        ..... push return.
- Pack Cntrl (20) ?        ..... push return.
- DisConnTime(00:00) ?    .....automatically power down set time when in no connection.  
(set data is \*\*:++ means \*\*minutes and ++seconds)  
(default data 00:00 means 5999s = 99min 59sec)
- SendChar 1 (0D)            ..... push return.
- SendChar 2 (0A)            ..... push return.

Select 9, then finished setting works

Change Setup:

- 0 Server configuration
- 1 Channel 1 configuration
- 3 E-mail settings
- 5 Expert settings
- 6 Security
- 7 Factory defaults
- 8 Exit without save
- 9 Save and exit                      Your choice ?

In these setting items, only IP address must be set. Other items may be no change to set.  
If you enter wrong number by mistake, you'd better to restore above data.

#### 2-2-3. Turn back PC set data

If you change setting data of PC, turn back PC data to initial condition.

#### 2-2-4. Connecting test

Let's try connecting test by optional Windows software such as "telnet".

Example test data is "telnet 192.168.1.55 7777" in MS-DOS prompt screen.

(IP address number must to be set number preliminary. )

When in telnet operation, send data "VER?" which are expected reply data.

If reply data is like "1. 00 05-07-07", then communication line is right.

"Telnet" function contains hardware and software function, when disconnect line, line must be cut off by "telnet" software operation before hardware disconnection.

#### 2-3. Setting USB communication

##### 2-3-1. Preparations for setting

Driver software for USB (Universal Serial Bus) operation is downloaded from our web server.

By installing this software, connecting is done like a COM port connection.

Switch on a NCT08-02, connect USB cable, then there will be message box that shows "New hardware device was found". According to PC directions, specify the folders of downloaded driver software.

When the driver software installs are done, open the "Control Panel" ( START → Control Panel), click the "System" icon. Then property display of system appears. Select the "Device Manager".

Confirm the USB Serial Port (Com\*) number in the tree between Port display.

Select the USB Serial Port (Com\*), click Advanced in Port Setting display. It's possible to change COM Port number. Click the check box Disable PNP  , it's possible to short operation time in connecting USB cable again.

##### 2-3-2. Connecting test

Launch RS-232C communication software such as hyper-terminal included in your PC.

Set COM port number which is known in previous item, it's need to check communication line is available or not. In this case It's no need to set baud rate. Send the command data such as "VER?", then get the reply "1.00 04-09-03", there is no problem for communication

#### 2-4. Connect signal cables

##### 2-4-1. Connect communication cables

Connect the communication cable to USB port or LAN port on rear panel.

There is no need to connect both side, but there will be no problem even if connect both side.

If connected both side, latest command will be valid to the unit.

#### 2-4-2. Connect count signal

Connect count signal cable to CH0 to CH7 LEMO connector which are on front panel.

It's possible to count maximum 8 channel signals.

#### 2-4-3. Start signal (TTL positive logic)

TTL positive logic signal starts counting action.

The width of start signal pulse must be more than 100ns.

It's possible to check the count start status by LED lamp on front panel.

It counts from start signal "ON" to stop signal "ON".

Without this signal you can also start counting by software commands via LAN or USB.

#### 2-4-4. Stop signal (TTL positive logic)

TTL positive logic signal quits counting action.

The width of stop signal pulse must be more than 100ns.

It's possible to check the count stop status by LED lamp on front panel.

It counts from start signal "ON" to stop signal "ON".

Without this signal you can also stop counting by software commands via LAN or USB.

#### 2-4-5. Gate signal (TTL positive logic)

Gate signal is TTL positive logic signal.

When gate signal goes "L" counting action stopped during "L" period.

When gate signal goes "L" LED lamp is "OFF" during this period.

LED lamp goes "ON" during gate signal is "H" when counter starts.

When gate signal is no connection, gate signal is equal to logic "H".

#### 2-4-6. Monitor out signal(In counting, TTL positive logic)

Run signal goes "H" when counting action is valid. It means count start and "Gate signal" are in "H" logic, and LED goes "ON".

It's useful to use more than two counter units. Connecting this line to "Gate signal input" of another unit, another units go active counting action. Of course another units must be active in count mode before Run signal go "H".

### 3. Explanation of communication commands

#### 3-1. Communication commands

Command characters are ASCII data.

The delimiter of communication command is CR+LF in transmit and receive case.

#### 3-2. Read-out commands for counter set and the status of setting

##### 3-2-1. Stop enable by count value

Type of command

ENCS

Enable to stop count by counter(CH7).

When count value of preset channel (CH7) reach to preset value, count action automatically stopped.

### 3-2-2. Stop enable by timer value

Type of command

ENTS                                      Enable to stop count by timer.  
When timer value reach to preset timer value, count action automatically stopped.

### 3-2-3. Disable auto stopping by counter value or timer value

Type of command

DSAS                                      Disable to stop count by counter (CH7) or timer.  
Counter doesn't stop automatically.  
To quit counter action, it's valid to "STOP" command or "STOP" input signal (TTL level).

### 3-2-4. Inquiry of action mode

Type of command

MOD?                                      The latest counter mode is read.

Reply

R\_SN\_T\_O                                  R: remote mode (fixed)  
SN: single mode (fixed)  
T: T/timer stop mode, C/counter stop mode, N/not stop mode  
(When power switch on, the last mode data is restored)  
O: O/counter On, F/counter off  
(When power switch on, count function is "OFF".)

### 3-2-5. Setting and readout of preset counter

Type of command

SCPRdddd••••                              To set preset value dddd••••• in decimal to preset counter.  
Unit is Kcts.  
Maximum value is 281,474,976,710 Kcts.

SCPRFdddd••••                              To set preset value dddd••••• in decimal to preset counter.  
Unit is cts.  
Maximum value is 281,474,976,710,655 cts.  
\*) The preset value is round down to multiple number of eight.

Inquiry command format

CPR?                                      To read out preset count value.

Reply

00654321                                  Reply data is 8 digit decimal value.  
4294967000                                (If reply data is over 8 digit, the digit is as the count digit.)  
Unit is Kcts.

CPRF?                                      To read out preset count value.

Reply

00654321                                  Reply data is 8 digit decimal value.  
4294967000                                (If reply data is over 8 digit, the digit is as the count digit.)  
Unit is cts.

### 3-2-6. Setting and readout of preset timer

Type of command

STPRddd..... To set preset value dddd..... in decimal to timer.  
Unit is ms.

Maximum timer set value is 1,099,511,627 ms.

STPRFddd..... To set preset value dddd..... in decimal to timer.  
Unit is  $\mu$  s.

Maximum timer set value is 1,099,511,627,775  $\mu$  s.

Inquiry command format

TPR ? To read out preset timer value.

Reply

00123456 Reply data is 8 digit decimal value.

4294967000 (If reply data is over 8 digit, the digit is as the timer digit.)  
Unit is ms.

TPRF ? To read out preset count value.

Reply

00123456 Reply data is 8 digit decimal value.

4294967000 (If reply data is over 8 digit, the digit is as the timer digit.)  
Unit is  $\mu$  s.

### 3-3. Commands of counter operation

#### 3-3-1. Counter start

Type of command

STRT Enable counter start.

#### 3-3-2. Counter stop

Type of command

STOP Enable counter stop.

### 3-4. Read-out and clear commands for counter and timer

#### 3-4-1. Read-out and clear commands for all counter and timer

Type of command

RDAL ? To read all counter channels and timer

Reply

1234567890 2345678901 3456789012 ..... 0123456789

These data are 10 digit number in decimal.

The data order is CH0 CH1 CH2 ..... CH7 timer.

If reply data is over 10 digit, the digit is as the value digit.

Unit is cts for counter and  $\mu$  s for timer.

Type of command

CLAL ? To clear all counter channels and timer

### 3-4-2. Read-out and clear commands for all counter

Type of command

CTR ? xx                      To read count value of channel number xx.  
CTR ? xxyy                    To read count value from channel number xx to channel number yy.

Reply

1234567890                    Reply data is 10 digit data in decimal. Unit is cts.

1234567890 2345678901 3456789012 ..... 0123456789

Reply data is 10 digit data in decimal in order. Unit is cts.

If reply data is over 10 digit, the digit is as the value digit.

Type of command

CLCTxx                        To clear the count value of counter channel xx(00~07).

CLCTxxyy                    To clear the count value from counter channel xx to channel yy.

CLPC                         To clear the count value of preset counter channel 07.

### 3-4-3. Read-out and clear commands for timer

Type of command

TMR ?                        To read timer value.

Reply

1234567890                    Reply data is 10 digit data in decimal. Unit is  $\mu$  s.

If reply data is over 10 digit, the digit is as the value digit.

Type of command

CLTM                         To clear timer value.

### 3-5. Inquiry of over-flow count data

Type of command

ALM ?                        To inquiry about data overflow timer and count data

Reply example

overXXXX--                    Timer is in normal.

overXXXXTM                    Timer is overflow.

XXXX means overflow counter channel. XXXX is 4 digit hex data.

(Example)

over0001--                    It means counter CH0 is overflow.                    [0000 0001]

over0009--                    It means counter CH0 and CH3 are overflow.                    [0000 1001]

over0039--                    It means counter CH0,CH3, CH4 and CH5 are overflow.                    [0011 1001]

over000ATM                    It means counter CH1,CH3 and timer are overflow.                    [0000 1010]

over0000--                    It means no overflow.                    [0000 0000]

### 3-6. Inquiry of software version information

Type of command

VER ?                        To inquiry about software version information

Reply example

1.00 07-01-05 NCT08-02

Reply is in order, version number, date and type of the unit.

### 3-7. Other commands

#### (a) Type of command

FLG ? 0          FLG ? 1          FLG ? 2

Each command show the contents of unit.

Details are as these.

Reply for command "FLG?0"

b7:

b6:

b5:

b4:

b3: Counter number 3 overflow

b2: Counter number 2 overflow

b1: Counter number 1 overflow

b0: Counter number 0 overflow

Reply data "04" mean "Counter number 2 overflow".

Reply for command "FLG?1"

b7:

b6:

b5:

b4:

b3:

b2: Counter number 6 overflow

b1: Counter number 5 overflow

b0: Counter number 4 overflow

Reply data "04" mean "Counter number 6 overflow".

Reply for command "FLG?2"

b7: Time up carry monitor

b6: RUN OUT

b5: COUNTER ON

b4: Timer overflow

b3: Counter number 7 overflow

b2: TTL GATE

b1: TTL STOP

b0: TTL START

Reply data "04" mean "Counter number 7 overflow".

#### (b) Type of command

FROM ?

To check flash ROM number which includes active firmware software.

Refer to details see item 4. 「Firmware Version Upgrade」

Reply example

FROM0

FROM1

#### (c) Type of command

FROM0

Select flash ROM number which includes active firmware software.

FROM1

Refer to details see item 4. 「Firmware Version Upgrade」

#### 4. Firmware update

For NCT08-02 it's possible to upgrade firmware via communication tools.

Here is an overview of operation.

It's possible to use USB and LAN communication.

This is an example to install software by free soft "Tera Term" using LAN.

① First download the version upgrade software by Internet then unzip the file.

② Run "Tera Term" software.

In case of LAN mode, select "TCP/IP" enter IP address and port NO. of NCT08-02.

In case of USB mode, select "SERIAL" and click PORT number (COMX) which is assigned to USB port.

Operate "SETUP" to "Terminal", set "New-line" is CR+LF with Receive and Transmit usage.

Put check mark into Local echo, then select "OK".

Try put into command "VER?", then if there is reply, connection will be no problem.

③ By "Tera Term", select "file" and then click "send file".

Opening "File Selection Window", specify the file name which is already installed procedure ①.

Then it begins the download.

④ it's possible to check download program file by PC.

When receiving data, the "COUNT" LED lamp of unit NCT08-02 turns on and off slowly.

⑤ After receiving data for about 20s, the "COUNT" LED lamp goes to fast on and off mode then ROM writing session begins. After 5s, "COUNT" LED lamp turns off then this session will be done.

⑥ Stop "Tera Term" then cut off the line TCP/IP or USB, turn off power line of NCT08-02.

Turn on power of NCT08-02 again, the firmware version will be new.

Without turning off power line, it gets start by "RESET" command.

There are two pieces of flash ROM(FROM) loaded inside, new firmware is installed to one piece which is not used at now. After finishing writing a session, new one (written just now) is activated.

So after this session, by power off/on sequence or "RESET" command, new program will start.

It is possible to check the version of working FROM by the command "FROM?"

Reply data is like these, "FROM0", "FROM1".

It is possible to specify the version of working FROM by the command "FROM0" or "FROM1".

After specifying FROM version, turn on power action or "RESET" command will start again by specified FROM version. It is useful to compare old and new firmware version.

If you miss the download work and program doesn't work, it's possible to recover initial version firmware by the ROM print board inside.

This is the procedure of recover the program to initial state.

1. Cut off power line, open the left-side cover panel. Slide the dipswitch 2 "ON" side.

Dipswitch 1 keep "OFF" side.

2. Put on power line while shortening "GATE" input signal, "COUNT" LED turn on and off for about 15s.

After that "COUNT" LED turn off and session will be done.

3. Put off power line again, then slide the dipswitch 2 "OFF" side. Dipswitch 1 keep "OFF" side.

4. Put on power line again then program starts by initial version.

From now the latest file must be installed by procedure ① to ⑥.

## 5. Synchronous drive of multi units

It's possible to operate multi units synchronously.

The NCT08-02 contains 8 CH counters. You can use more than 9 channels at synchronous mode using multi units of NCT08-02.

Here are procedures of this usage.

Connect the RUN signal(TTL OUT) of first unit to the GATE signal(TTL IN) port of second unit.

It's the same way to the third unit.

Send "DSAS" command to latter unit. The latter units don't stop counting automatically.

Send "START" command to latter unit. The latter units start counting action.

Depend on your usage, put on "GATE" signal to first unit.

Depend on your usage, preset timer stop command to first unit. ("CLTM", "ENTS", "STPRddd")

Depend on your usage, preset counter stop command to first unit. ("CLPC", "ENCS", "SCPRddd")

Activate count mode of first unit by the command "START".

This procedure activate more than one unit at the same timing chart.

## 6. Regulations and guidelines

- (a) Regarding NCT08-02 when it receives data read command, it stops count and timer action for 120 ns.

This disable period is need to get latest data to latch 48 bits count data.

If you read out count data 100 times/s, total disable period is  $120\text{ns} \times 100 = 12 \mu\text{s}$ .

Disable period for each reading access is always same 120ns.

Counter and timer stops simultaneously you'd better to read data by minimum command.

When in counting pulse during "GATE" signal which comes from outside, you'll notice that counting period is shorter than read out period.

Unless read out count values in counting period there is no error of measurement.

When in timer stop mode or counter stop mode, there is no dead time to read out count values.

- (b) Notes when count multiple units at simultaneous control. (See 5. Synchronous operation by multi counter units.)

When you use multiple units at simultaneous control, you have to pay attention to error of measurement.

Concerning only read out module, measuring period is stopped for 120ns.

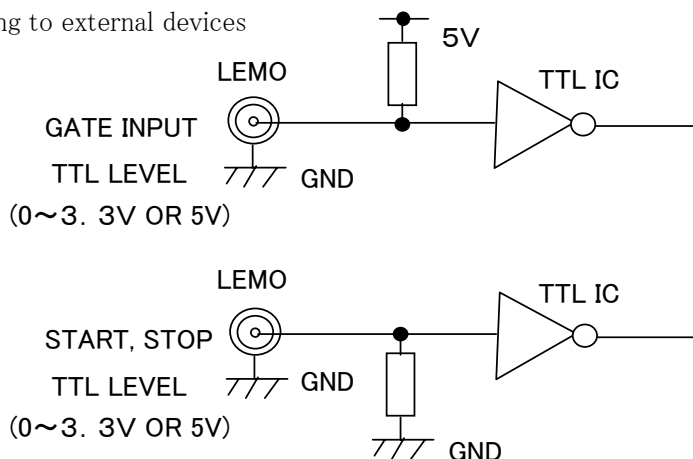
There for there are some errors of pulse count between units, because of the times or timing of data read out.

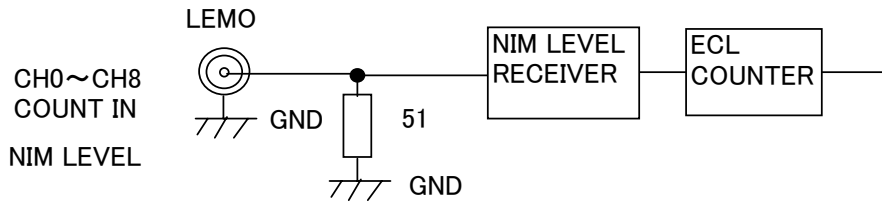
Example) When read out 100Times/1s for one module.

The period of counting pulse is  $12 \mu\text{s}$  shorter.  $120\text{ns} \times 100 = 12 \mu\text{s}$ .

In this case error ratio of count is  $12 \mu\text{s} / 1\text{s}$  (0.00012%).

## 7. Interfacing to external devices





## 8. Performance and specifications

Power	NIM AC85V~132V 0.2A, DC +6V:0.4A, -6V:0.3A	
Counter Input	Input level	Current Level -12mA~-36mA:"1" -4mA~+20mA:"0" Zin = 50 Ω Count frequency More than 500MHz
	Input connector	LEMO ERA00250
	Channels	0~7channels (CH7 is preset counter)
	Overflow digit	When count value over the limit send the data "over"
	Digit of count	48bit data (0~281,474,976,710,655 cts)
Timer	Number of channel	1channel 40bit 1~1,099,511,627,775 μs
	Resolution	0.000001s (1 μs)
	Accuracy	0.005%
	Preset time	1 ~ 1,099,511,627,775 μs
Special counter	Number of channel	1channel CH7 Fixed
	Preset count	1 ~ 281,474,976,710,655 cts
Counter Mode	single mode	Count starts by start trigger or "START" command Enable to count within preset value one time Temporarily turn into stop count by stop trigger or "STOP" command When disable to preset counter stop and preset timer stop counting action continues until stop trigger or "STOP" command
Gate in TTL	Enable to count or not for all channels and timer Goes to count mode by open or "H" level	
LED in counting	In count mode LED turn on "green"	
Signal out In counting	In count mode signal out goes "H" Connect this port to "Gate in TTL" of next unit. It's possible to activate multiple units simultaneously	
Control input	Count start input (by TTL rising edge), count stop input (by TTL rising edge)	
Communication	LAN, USB	
Version upgrade	Enable to upgrade firmware software by communication	
Case	NIM 1 UNIT	

For the further information, feel free to ask us.

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