TI DSP, MCU 및 Xilinx Zynq FPGA
프로그래밍 전문가 과정

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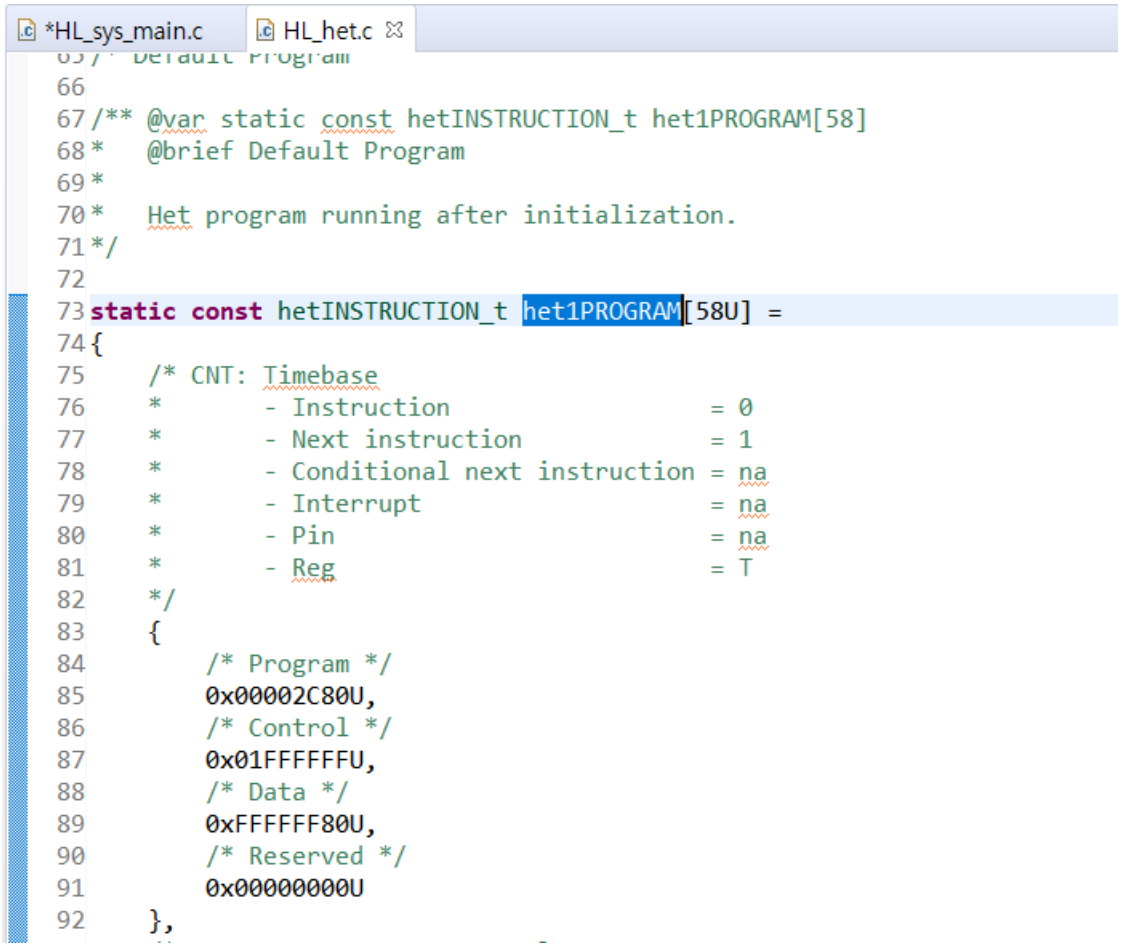


각각 4 바이트씩 총 16 바이트로 구성이 되어있다.

23.6.1 Instruction Summary

Table 23-73 presents a list of the instructions in the N2HET instruction set. The pages following describe each instruction in detail.

Table 23-73. Instruction Summary

Abbreviation	Instruction Name	Opcode	Sub-Opcode	Cycles[1]
ACMP	Angle Compare	Ch	-	1
ACNT	Angle Count	9h	-	2
ADCNST	Add Constant	5h	-	2
ADC	Add with Carry and Shift	4h	C[25:23] = 011, C5 = 1	1-3
ADD	Add and Shift	4h	C[25:23] = 001, C5 = 1	1-3
ADM32	Add Move 32	4h	C[25:23] = 000, C5 = 1	1-2
AND	Bitwise AND and Shift	4h	C[25:23] = 010, C5 = 1	1-3
APCNT	Angle Period Count	Eh	-	1-2
BR	Branch	Dh	-	1
CNT	Count	6h	-	1-2
DADM64	Data Add Move 64	2h	-	2
DJZ	Decrement and Jump if -zero	Ah	P[7:6] = 10	1
ECMP	Equality Compare	0h	C[6:5] = 00	1
ECNT	Event Count	Ah	P[7:6] = 01	1
MCMP	Magnitude Compare	0h	C[6] = 1	1
MOV32	Move 32	4h	C[5] = 0	1-2
MOV64	Move 64	1h	-	1
OR	Bitwise OR	4h	C[25:23] = 100, C5 = 1	1-3
PCNT	Period/Pulse Count	7h	-	1
PWCNT	Pulse Width Count	Ah	P[7:6] = 11	1
RADM64	Register Add Move 64	3h	-	1
RCNT	Ratio Count	Ah	P[7:6] = 00, P[0] = 1	3
SBB	Subtract with Borrow and Shift	4h	C[25:23] =110, C[5] = 1	1-3
SCMP	Sequence Compare	0h	C[6:5] = 01	1
SCNT	Step Count	Ah	P[7:6] = 00, P[0] = 0	3
SHFT	Shift	Fh	C[3] = 0	1
SUB	Subtract and Shift	4h	C[25:23] = 101, C[5] = 1	1-3
WCAP	Software Capture Word	Bh	-	1
WCAPE	Software Capture Word and Event Count	8h	-	1
XOR	Bitwise Exclusive-Or and Shift	4h	C[25:23] = 111, C[5] = 1	1-3

(1) Cycles refers to the clock cycle of the N2HET module; which on most devices is VCLK2. (Check the device datasheet description of clock domains to confirm). If the high-resolution prescale value is set to /1, then this is also the same as the number of HR clock cycles.

```
Abbreviation    Instruction Name    Opcode

 CNT             Count              6h


/* Program */
       0x00002C80U,

0000 0000 0000 0000 0010 1100 1000 0000

13, 11, 10, 7 번째 비트
```

23.6.3.8 CNT (Count)

Syntax

```
CNT {
[brk={OFF | ON}]
[next={label | 9-bit unsigned integer}]
[reqnum={3-bit unsigned integer}]
[request={NOREQ | GENREQ | QUIET}]
[angle_count={OFF | ON}]
[reg={A | B | T | NONE}]
[comp ={EQ | GE}]
[irq={OFF | ON}]
[control={OFF | ON}]
max={25-bit unsigned integer}
[data={25-bit unsigned integer]
}
```

Figure 23-134. CNT Program Field (P31:P0)

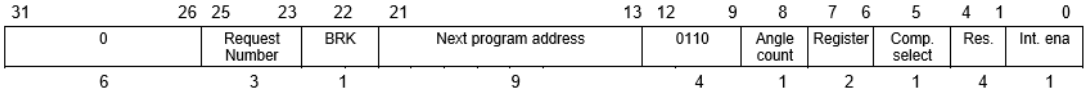


Figure 23-135. CNT Control Field (C31:C0)

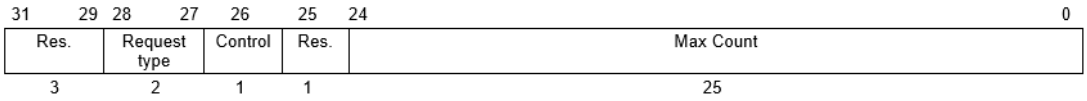
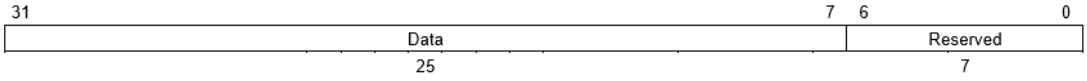


Figure 23-136. CNT Data Field (D31:D0)



가상타이머를 정의하는 부분이다.

13~21 번째 비트는 next program address 나타낸다.

이 코드에서는 1 로 배열의 1 번으로 가라는 뜻이다.

12~9 번 비트는 opcode 로 0110 즉, 6 이다.

아까 Instruction Summary 테이블에서 확인했던 데이터와 같은 것을 볼 수 있다.

7 번 비트는 레지스터로 사용될 수 있는 범용 레지스터를 뜻한다.

A, B or T 중 한 개니까 2 비트로 표현이 가능하며 여기서는 T 이다

```
*       - Reg                          = T
```

Reg* Register select: Selects the register for data comparison and storage
Default: No register (None)
Location: Control field [2:1] except for CNT instruction.
Extended Register Select C[7] is available for ACMP, ADC, ADD, ADM32, AND, DADM64, ECMP, ECNT, MCMP, MOV32, MOV64, OR, RADM64, SBB, SHFT, SUB, WCAP, WCAPE instructions.

Register	Ext Reg. C[7]	C[2]	C[1]
A	0	0	0
B	0	0	1
T	0	1	0
None	0	1	1
R	1	0	0
S	1	0	1
Reserved	1	1	0
Reserved	1	1	1

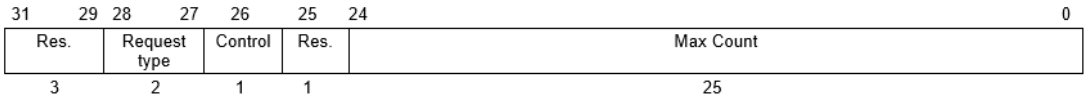
Register modified Selected register (A, B or T)

```
/* Control */
       0x01FFFFFFU,
```

0000 0001 1111 1111 1111 1111 1111 1111

0~24 비트까지 1 이다.

Figure 23-135. CNT Control Field (C31:C0)

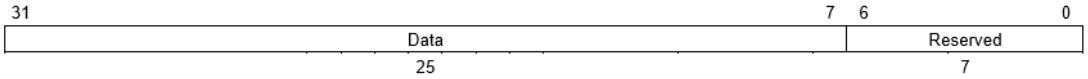


```
/* Data */
        0xFFFFFF80U,
```

1111 1111 1111 1111 1111 1111 1000 0000

7 ~ 31 비트까지 1이다.

Figure 23-136. CNT Data Field (D31:D0)



Description	This instruction defines a virtual timer. The counter value stored in the data field [D31:7] is incremented unconditionally on each execution of the instruction when in time mode (angle count bit [P8] = 0). When the count reaches the maximum count specified in the control field, the counter is reset. It takes one cycle in this mode. In angle mode (angle count bit [P8] = 1), CNT needs data from the software angle generator (SWAG). When in angle count mode the angle increment value will be 0 or 1. It takes two cycles in this mode.

데이터 필드 [D31:7]에 저장된 카운터 값은 시간 모드일 때 명령어의 각 실행마다 무조건 증가하며, 카운트가 제어 필드에 지정된 최대 카운트에 도달하면 카운터가 재설정된다.

max	Specifies the 25-bit integer value that defines the maximum count value allowed in the data field. When the count in the data field is equal to max, the data field is reset to 0 and the Z system flag is set to 1.

데이터 필드의 카운트가 max와 같으면 데이터 필드가 0으로 재설정되고 Z 시스템 플래그가 1로 설정됨