
H8/300H Tiny Series

ASCII Code to 1-Byte-Hexadecimal Conversion (NIBBLE)

Introduction

Converts the ASCII code for '0' to '9' or 'A' to 'F' to the 1-byte hexadecimal number.

Target Device

H8/300H Tiny Series

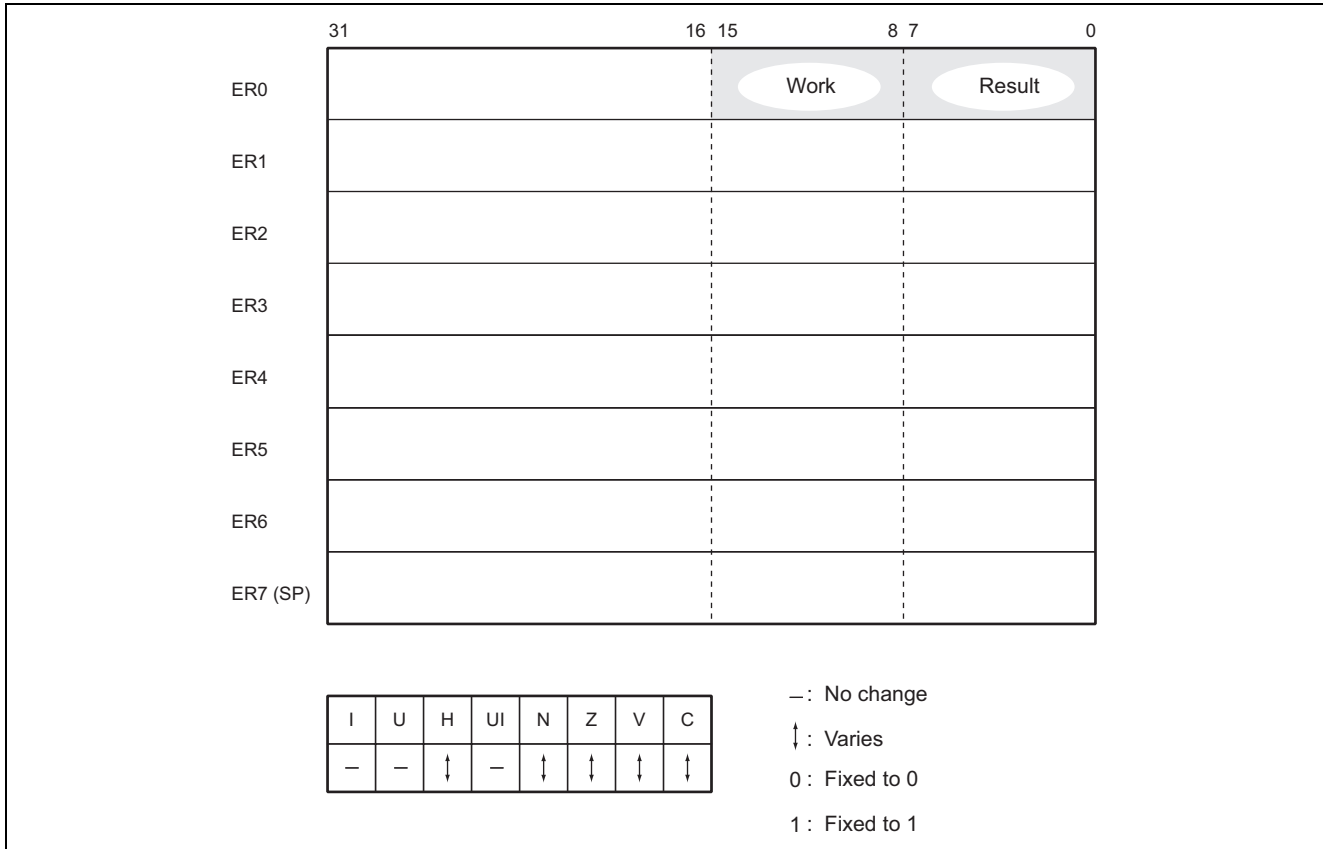
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1. Arguments

	Contents	Storage Location	Data Length (Bytes)
Input	ASCII code	R0L	1
Output	1-byte hexadecimal number	R0L	1
	Indicator of conversion	C flag (CCR)	—

2. Changes to Internal Registers and Flags



3. Programming Specifications

Program memory (bytes)
24
Data memory (bytes)
0
Stack (bytes)
0
Number of cycles
38
Re-entrant
Yes
Relocatable
Yes
Interrupts during execution
Yes

4. Description

4.1 Description of Functions

- The arguments are as follows.

R0L: Set the ASCII code here. The 1-byte hexadecimal number is placed here by execution of the NIBBLE subroutine.

C flag (CCR): Indicates the status after execution of the software NIBBLE as the output arguments.

C flag = 1: The input ASCII code is in neither of the ranges '0' to '9' and 'A' to 'F'

C flag = 0: The input ASCII code is in the ranges '0' to '9' or 'A' to 'F'

- The following figure illustrates the execution of the NIBBLE subroutine. When the input argument is set to the ASCII code for 'F', the corresponding hexadecimal digit (H'0F) is set in R0L.

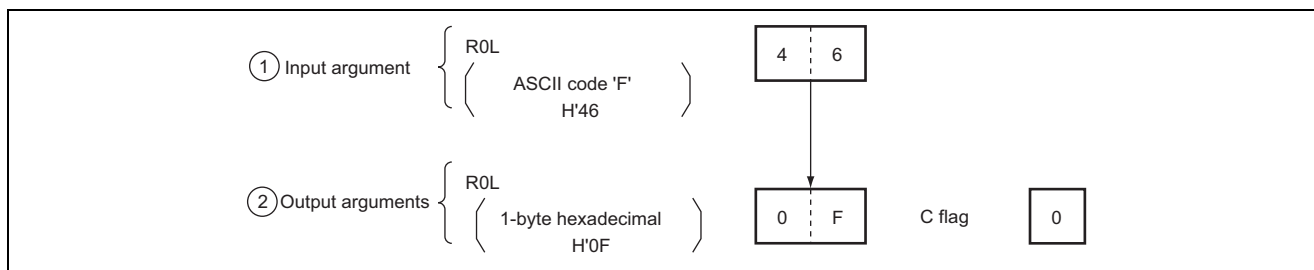


Figure 1 Example of NIBBLE Execution

4.2 Usage Note

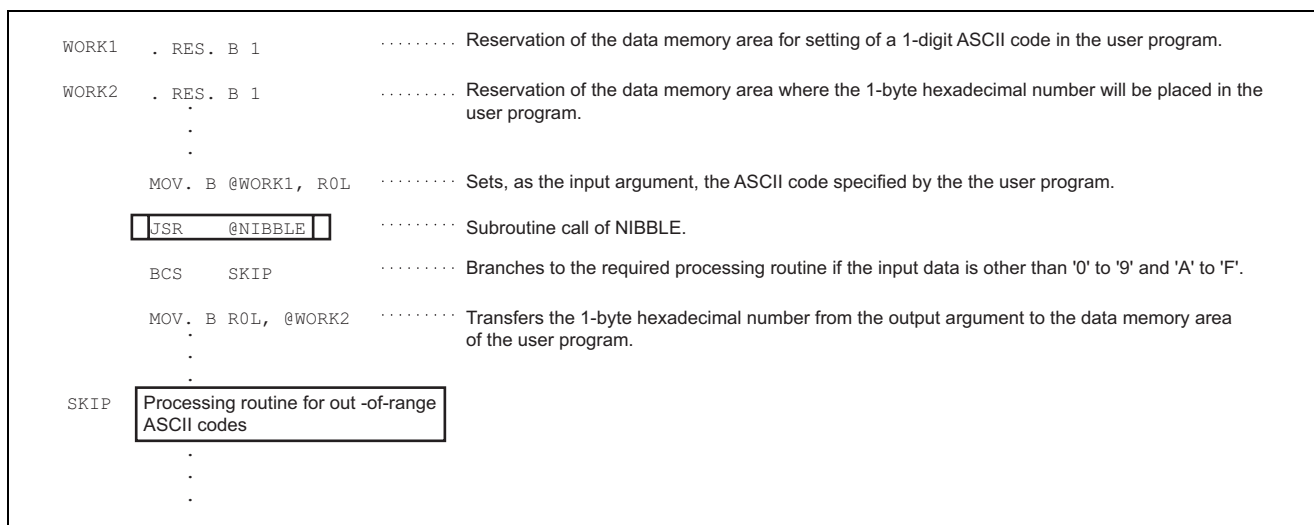
Input data that is not in the ranges of the ASCII codes for '0' to '9' or 'A' to 'F' is lost in the execution of NIBBLE.

4.3 Description of Data Memory

No data memory is used by NIBBLE.

4.4 Example of Usage

After setting the ASCII code, call the NIBBLE subroutine.



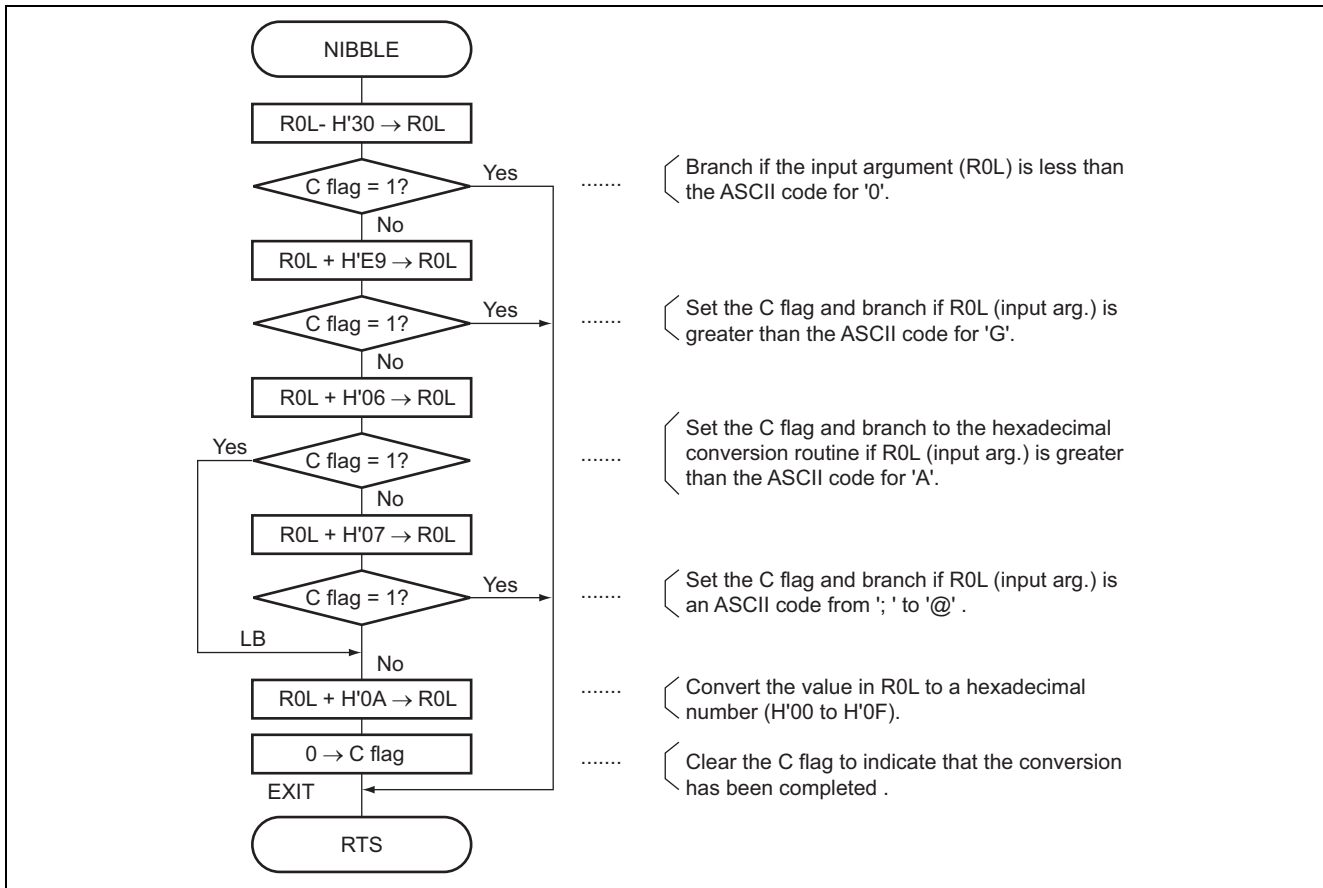
4.5 Principles of Operation

1. Whether or not the data set in ROL falls within the ASCII code range '0' to '9' or 'A' to 'F' (the parts enclosed by in the table below) is determined by tests of the C flag, which indicates the results of calculation in ROL.
2. Further operation is performed to exclude codes in the range from ':' to '@' (the shaded parts of the table).
3. If the data is in neither of the ranges '0' to '9' and 'A' to 'F', the C flag is set to '1' during the processing of steps 1 and 2.

Table 1 ASCII Coding

LSD	MSD	0	1	2	3	4	5	6	7
	000	001	010	011	100	101	110	111	
0	0000	NUL	DLE	SP	0	@	P	`	p
1	0001	SOH	DC ₁	!	1	A	Q	a	q
2	0010	STX	DC ₂	"	2	B	R	b	r
3	0011	ETX	DC ₃	#	3	C	S	c	s
4	0100	EOT	DC ₄	\$	4	D	T	d	t
5	0101	ENG	NAK	%	5	E	U	e	u
6	0110	ACK	SYN	&	6	F	V	f	v
7	0111	BEL	ETB	'	7	G	W	g	w
8	1000	BS	CAN	(	8	H	X	h	x
9	1001	HT	EM	)	9	I	Y	i	y
A	1010	LF	SUB	*	:	J	Z	j	z
B	1011	VT	ESC	+	;	K	[	k	{
C	1100	FF	FS	,	<	L	\	l	|
D	1101	CR	GS	-	=	M	]	m	}
E	1110	SO	RS	.	>	N	↑	n	~
F	1111	SI	VS	/	?	O	←	o	DEL

5. Flowchart



6. Program Listing

```

1          1  ;*****
2          2  ;*
3          3  ;*      NAME :      CHANGE 1 BYTE ASCII CODE
4          4  ;*
5          5  ;*
6          6  ;*****
7          7  ;*
8          8  ;*      ENTRY:      R0L          (1 BYTE ASCII CODE)
9          9  ;*
10         10 ;*      RETURN:     R0L          (4 BIT HEXADECIMAL)
11        11 ;*
12        12 ;*
13        13 ;*****
14        14 ;
15        15      .CPU          300HN
16        16      .SECTION     NIBBLE_code, CODE, ALIGN=2
17        17      .EXPORT      NIBBLE
18        18 ;
19        19      NIBBLE      .EQU      $          ;Entry point
20        20      0000 F030      MOV.B      #H'30,R0H
21        21      0002 1808      SUB.B      R0H,R0L          ;R0L - #H'30 ('0') -> R0L
22        22      0004 4510      BCS        EXIT          ;Leave if R0L < 0
23        23      0006 88E9      ADD.B      #H'E9,R0L          ; H'E9-H'30= '9'
24        24      0008 450C      BCS        EXIT          ;Branch if R0L > 'F'
25        25      000A 8806      ADD.B      #H'06,R0L          ;
26        26      000C 4504      BCS        LBL          ;Branch if R0L >= H'FF
27        27      000E 8807      ADD.B      #H'07,R0L          ;
28        28      0010 4504      BCS        EXIT          ;Branch if R0L >= H'FF
29        29      0012 880A      LBL      ADD.B      #H'0A,R0L          ;Change R0L to ASCII CODE
30        30      0014 06FE      ANDC      #H'FE,CCR          ;Clear C flag of CCR
31        31 ;
32        32      0016          EXIT
33        33      0016 5470      RTS
34        34 ;
35        35      .END

***** TOTAL ERRORS      0
***** TOTAL WARNINGS    0

```

Revision Record

Rev.	Date	Description	
		Page	Summary
2.00	Jun.12.06	—	Format has been changed from Hitachi version to Renesas version.

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