

decimal	hexadecimal	binary	Data type	Size	Range	Alignment	
0	0	0000	bool	8 bits	0 to 1	1	
1	1	0001	char	8 bits	0 to 255	1	
2	2	0010	signed char	8 bits	-128 to 127	1	
3	3	0011					
4	4	0100	unsigned char	8 bits	0 to 255	1	
5	5	0101	signed short	16 bits	-32768 to 32767	2	
6	6	0110	unsigned short	16 bits	0 to 65535	2	
7	7	0111	signed int	16 bits	-32768 to 32767	2	
8	8	1000	unsigned int	16 bits	0 to 65535	2	
9	9	1001	signed long	32 bits	-2 <sup>31</sup> to 2 <sup>31</sup> -1	2	
10	A	1010	unsigned long	32 bits	0 to 2 <sup>32</sup> -1	2	
11	B	1011	signed long long	64 bits	-2 <sup>63</sup> to 2 <sup>63</sup> -1	2	
12	C	1100	unsigned long long	64 bits	0 to 2 <sup>64</sup> -1	2	
13	D	1101	float	32 bits			
14	E	1110	double	64 bits			
15	F	1111					
15	14	13	12	11	10	9	
8	7	6	5	4	3	2	
1	0					0	
Op-code		S-Reg		Ad	B/W	As	D-Reg

As	Ad	Addressing Mode	Syntax	Description
00	0	Register Mode $\ddot{\sigma} 0$	Rn	Register contents are operand
01	1	Indexed Mode $\ddot{\sigma} 1$	X(Rn)	(Rn + X) points to the operand. X is stored in the next word
01	1	Symbolic Mode $\ddot{\sigma} 1$	ADDR	(PC + X) points to the operand. X is stored in the next word. Index Mode X(PC) is used
01	1	Absolute Mode $\ddot{\sigma} 1$	&ADDR	The word following the instruction contains the absolute address
10	-	Indirect Register Mode $\ddot{\sigma} 6$	@Rn	Rn is used as a pointer to the operand
11	-	Indirect Autoincrement $\ddot{\sigma} 6$	@Rn+	Rn is used as a pointer to the operand. Rn is incremented afterwards
11	-	Immediate Mode $\ddot{\sigma} 1$	#N	The word following the instruction contains the immediate constant N. Indirect Autoincrement Mode @PC+ is used

Mnemonic and Syntax	Description	See
bss symbol, size in bytes, alignment]	Reserves size bytes in the bss (uninitialized data) section	bss topic
data	Assembles into the data (initialized data) section	data topic
.intvec	Creates an interrupt vector entry in a named section that points to an interrupt routine name	.intvec topic
sect "section name"	Assembles into a named (initialized) section	sect topic
text	Assembles into the text (executable code) section	text topic
symbol.usect "section name", size in bytes [; alignment]	Reserves size bytes in a named (uninitialized) section	.usect topic
.bss uninitialized		
.data initialized		
.text executable		
.long 32 bit		
.word 16 bit		
.string 16 bit		
.int 16 bit		
words: .word 2, -1, 3, 4 (4 16 bit words)		
Instruction length in words is +1 for all that are not indirect or autoincrement		

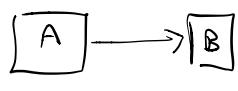
$ET = IC \times CPI \times CCT = \frac{IC \times CPI}{CCF}$	Million of instructions per second
IC = Instruction count	
CPI = Cycles per instruction	
CCT = Clock cycle time	
CCF = Clock frequency	
$CCT = \frac{1}{CCF}$	

For lookup table, radix mode is approximate.



Simple

Unidirectional



One at a time  
half-duplex



both at same  
time.

full duplex

$$O \rightarrow 2^n - 1$$

$$-2^{n-1} \rightarrow 2^{n-1} - 1$$

$$T = 0.5 \text{ ms} \Rightarrow f = 1/0.5 \times 10^{-3} = 2000 \text{ Hz}$$

$$f = 1/p$$

Mnemonic	S-Reg, D-Reg	Operation	Status Bits <sup>(1)</sup>			
			V	N	Z	C
MOV (, B)	src,dst	src $\rightarrow$ dst	-	-	-	-
ADD (, B)	src,dst	src + dst $\rightarrow$ dst	*	*	*	*
ADDC (, B)	src,dst	src + dst + C $\rightarrow$ dst	*	*	*	*
SUB (, B)	src,dst	dst + not(src + C) $\rightarrow$ dst	*	*	*	*
SUBC (, B)	src,dst	dst + not(src + C) $\rightarrow$ dst	*	*	*	*
CMP (, B)	src,dst	dst $\rightarrow$ dst	*	*	*	*
DADD (, B)	src,dst	src + dst + C $\rightarrow$ dst (decimally)	*	*	*	*
BIT (, B)	src,dst	src.and. dst	0	*	*	*
BIC (, B)	src,dst	.not src.and. dst $\rightarrow$ dst	-	-	-	-
BIS (, B)	src,dst	src.or. dst $\rightarrow$ dst	-	-	-	-
XOR (, B)	src,dst	src.xor. dst $\rightarrow$ dst	*	*	*	*
AND (, B)	src,dst	src.and. dst $\rightarrow$ dst	0	*	*	*

<sup>(1)</sup> \* = Status bit is affected.  
- = Status bit is not affected  
0 = Status bit is cleared.  
1 = Status bit is set.

Dec	Hx	Oct	Hex	Chr	Dec	Hx	Oct	Hex	Chr
0	0 000	000	000		32	20 040	0402;	8	96 60 140 096;
1	2 002	002	002		34 22 042	0420;	10	97 62 142 097;	a
2	4 004	004	004		66 42 102	4466;	12	98 62 142 098;	b
3	3 003	003	003		35 23 043	4435;	13	99 63 143 099;	c
4	4 004	004	004		34 24 044	4436;	14	98 64 144 098;	d
5	5 005	005	005		35 25 045	4437;	15	99 65 145 099;	e
6	6 006	006	006		69 44 104	4469;	16	100 64 144 100;	f
7	7 007	007	007		39 27 047	4439;	17	101 65 145 101;	g
8	8 010	010	010		73 47 110	4473;	18	102 66 146 102;	h
9	9 011	011	011		73 49 111	4473;	19	103 67 147 103;	i
10	10 012	012	012		74 51 112	4474;	20	104 68 150 104;	j
11	11 013	013	013		75 48 113	4475;	21	105 69 151 105;	k
12	C 014	014	014		76 46 114	4476;	22	106 70 160 106;	l
13	D 015	015	015		45 42 055	4445;	23	107 71 161 107;	m
14	E 016	016	016		46 42 056	4446;	24	108 72 162 108;	n
15	F 017	017	017		47 42 057	4447;	25	109 73 163 109;	o
16	10 020	020	020		78 46 116	4478;	26	110 74 164 110;	p
17	11 021	021	021		79 47 117	4479;	27	111 75 165 111;	q
18	12 022	022	022		80 50 120	4480;	28	112 76 166 112;	r
19	13 023	023	023		81 51 121	4481;	29	113 77 167 113;	s
20	14 024	024	024		84 54 124	4484;	30	114 78 168 114;	t
21	15 025	025	025		86 56 126	4486;	31	115 79 169 115;	u
22	16 026	026	026		88 57 127	4488;	32	116 80 170 116;	v
23	17 027	027	027		89 58 128	4489;	33	117 81 171 117;	w
24	18 028	028	028		90 59 129	4490;	34	118 82 172 118;	x
25	19 031	031	031		89 59 131	4489;	35	119 83 173 119;	y
26	16 032	032	032		90 58 132	4490;	36	120 84 174 120;	z
27	18 033	033	033		91 58 133	4491;	37	121 85 175 121;	
28	16 034	034	034		60 30 074	4474;	38	122 86 176 122;	
29	17 035	035	035		92 56 134	4492;	39	123 87 177 123;	
30	18 036	036	036		93 57 135	4493;	40	124 88 178 124;	
31	19 037	037	037		62 30 076	4472;	41	94 82 136 4494;	
					63 30 077	4473;	42	126 7E 176 44126;	
					63 30 078	4474;	43	127 7F 177 44127;	DEL

Source: www.LookupTables.com

For lookup table, radix mode is approximate.



Simple

Unidirectional



One at a time  
half-duplex



both at same  
time.

full duplex

Metric Prefix	Symbol	Multiplier (Traditional Notation)	Exponential	Description
Yotta	Y	1,000,000,000,000,000,000,000	$10^{24}$	Septillion
Zetta	Z	1,000,000,000,000,000,000,000	$10^{21}$	Sextillion
Exa	E	1,000,000,000,000,000,000	$10^{18}$	Quintillion
Peta	P	1,000,000,000,000,000	$10^{15}$	Quadrillion
Tera	T	1,000,000,000,000	$10^{12}$	Trillion
Giga	G	1,000,000,000	$10^9$	Billion
Mega	M	1,000,000	$10^6$	Million
kilo	k	1,000	$10^3$	Thousand
hecto	h	100	$10^2$	Hundred
deca	da	10	$10^1$	Ten
base	b	1	$10^0$	One
deci	d	1/10	$10^{-1}$	Tenth
centi	c	1/100	$10^{-2}$	Hundredth
milli	m	1/1,000	$10^{-3}$	Thousandth
micro	μ	1/1,000,000	$10^{-6}$	Millionth
nano	n	1/1,000,000,000	$10^{-9}$	Billionth
pico	p	1/1,000,000,000,000	$10^{-12}$	Trillionth
femto	f	1/1,000,000,000,000,000	$10^{-15}$	Quadrillionth
atto	a	1/1,000,000,000,000,000,000	$10^{-18}$	Quintillionth
zepto	z	1/1,000,000,000,000,000,000,000	$10^{-21}$	Sextillionth
yocto	y	1/1,000,000,000,000,000,000,000,000	$10^{-24}$	Septillionth