Fontware Barcode Solutions - Code 128

What is it?
Code 128 consists of three Sub-Sets for different uses of this Barcode.

Sub-set A
includes all of the standard upper case alphanumeric keyboard characters plus the control and the special characters.

Sub-set B
Includes all of the standard upper case alphanumeric keyboard characters plus lower case alphabetic and the special characters.

Sub-set C
Includes the set of 100 digit pairs from the 00 to 99 inclusive, as well as special characters. This allows double density numeric digits, two digit per bar coded character, to be defined.

Special Characters
The last seven characters of Code Subsets A and B and the last three characters of code set C are special non-data characters that define special operations to the code reading device. These characters are never displayed or transmitted by the code reading device.

It is possible to change from one code subset to another within a symbol using the code or shift special characters. The code characters allow a code subset change for all characters following it in the symbol. The shift character allows a code subset shift for character only. Function Characters (FNC) define instructions to the code reading device to allow for special operations and applications.

Code Characters.
Code A,B or C characters change the symbol code subset from the subset defined previously to the new code subset defined by the code character. This change is applicable for all characters following the code character until either the end of the symbol or another code character is encountered.

Shift Character.
The shift character change the code subset from A to B or B to A for the single character following the affected character revert to the Code Subset A or B that was defined previously to the shift character.

Function Characters.
FNC 1 is reserved exclusively for EAN/UCC use.

FNC 2 (Message Append) instructs the code reader to temporarily store the data from the symbol containing the FNC 2 character and transmit it as a prefix to the next symbol data. This may be used to concatenate several symbols before transmission. This character can occur anywhere in the symbol.

FNC 3 (Initialize) instructs the code reader to interpret the data from the symbol containing the FNC 3 character as instructions for initialization or reinitialization of the code reader. The data from the symbol will not be transmitted by the code reader. This character can occur anywhere in the symbol.

FNC 4 is available for use in closed systems.

How do I calculate each subset?
Values are obtained from the table on opposing page.

Codeset A.

Start Code		**F**	**O**	**N**	**T**
Value	103	38	47	46	52
Position	1	1	2	3	4
Multiply Values	103	38	94	138	208
Total	581				
Divide (MOD)	581 / code set A(103)				
Symbol Value	(66) + 32 = 98				
(ASCII Character b)					
Final code	135 FONT b 138				

Codeset B.

Start Code		**F**	**O**	**N**	**T**
Value	104	38	47	46	52
Position	1	1	2	3	4
Multiply Values	104	38	94	138	208
Total	582				
Divide (MOD)	582 / 104 = 5 remainder 67				
Symbol Value	(67) + 32 = 99				
(ASCII Character c)					
Final code	136 FONT c 138				

Code C.

Code C is checksum by calculating the data as paired. For example the data **1234567890** would be paired as **12 34 56 78 90**

Now we have our data pair now we can calculate them into a barcode data.

Data Pair	12	34	56	78	90	0	0	0
Data Position 1	2	3	4	5	0	0	0	
Data value	12	34	56	78	90	0	0	0
Value * Pos	12	68	168	312	450	0	0	0

Add the values together with the Code C (105) value. 105+12+68+168+312+450+0+0+0 = 1,115

Divide the total by 103 gives you 10 remainder 85. So the checksum character is symbol character value 85 = ASCII 117 u
To encode your data string, you simply add 32 to each of the values created from pairing the original data.
eg.

	ASCII
12 = 44	,
34 = 66	B
56 = 88	X
78 = 110	n
90 = 122	z

Then finally you have you final string sequence.

137	Start Character
,BXnz	Encoded Data String
u	Checksum character
138	Stop Character.

Code 128 Character & Symbol Values

Symbol Character Value	ASCII Character Code	Code A	Code B	Code C
0	32	SP	SP	00
1	33	!	!	01
2	34	"	"	02
3	35	#	#	03
4	36	$	$	04
5	37	%	%	05
6	38	&	&	06
7	39	'	'	07
8	40	(	(	08
9	41	)	)	09
10	42	*	*	10
11	43	+	+	11
12	44	,	,	12
13	45	-	-	13
14	46	.	.	14
15	47	/	/	15
16	48	0	0	16
17	49	1	1	17
18	50	2	2	18
19	51	3	3	19
20	52	4	4	20
21	53	5	5	21
22	54	6	6	22
23	55	7	7	23
24	56	8	8	24
25	57	9	9	25
26	58	:	:	26
27	59	;	;	27
28	60	<	<	28
29	61	=	=	29
30	62	>	>	30
31	63	?	?	31
32	64	@	@	32
33	65	A	A	33
34	66	B	B	34
35	67	C	C	35
36	68	D	D	36
37	69	E	E	37
38	70	F	F	38
39	71	G	G	39
40	72	H	H	40
41	73	I	I	41
42	74	J	J	42
43	75	K	K	43
44	76	L	L	44
45	77	M	M	45
46	78	N	N	46
47	79	O	O	47
48	80	P	P	48
49	81	Q	Q	49
50	82	R	R	50
51	83	S	S	51
52	84	T	T	52
53	85	U	U	53
54	86	V	V	54
55	87	W	W	55
56	88	X	X	56
57	89	Y	Y	57
58	90	Z	Z	58
59	91	[	[	59
60	92	\	\	60
61	93	]	]	61
62	94	^	^	62
63	95	_	_	63
64	96	NUL	`	64
65	97	SOH	a	65
66	98	STX	b	66
67	99	ETX	c	67
68	100	EOT	d	68
69	101	ENQ	e	69
70	102	ACK	f	70
71	103	BEL	g	71
72	104	BS	h	72
73	105	HT	i	73
74	106	LF	j	74
75	107	VT	k	75
76	108	FF	l	76
77	109	CR	m	77
78	110	SO	n	78
79	111	SI	o	79
80	112	DLE	p	80
81	113	DC1	q	81
82	114	DC2	r	82
83	115	DC3	s	83
84	116	DC4	t	84
85	117	NAK	u	85
86	118	SYN	v	86
87	119	ETB	w	87
88	120	CAN	x	88
89	121	EM	y	89
90	122	SUB	z	90
91	123	ESC	{	91
92	124	FS	|	92
93	125	GS	}	93
94	126	RS	~	94
95	127	US	DEL	95
96	128	FNC 3	FNC 3	96
97	129	FNC 2	FNC 2	97
98	130	SHIFT	SHIFT	98
99	131	CODE C	CODE C	99
100	132	CODE B	FNC 4	CODE
101	133	FNC 4	CODE A	CODE
102	134	FNC 1	FNC 1	FNC 1
103	135	START	(CODE A)	
104	136	START	(CODE B)	
105	137	START	(CODE C)	
106	138	STOP		