



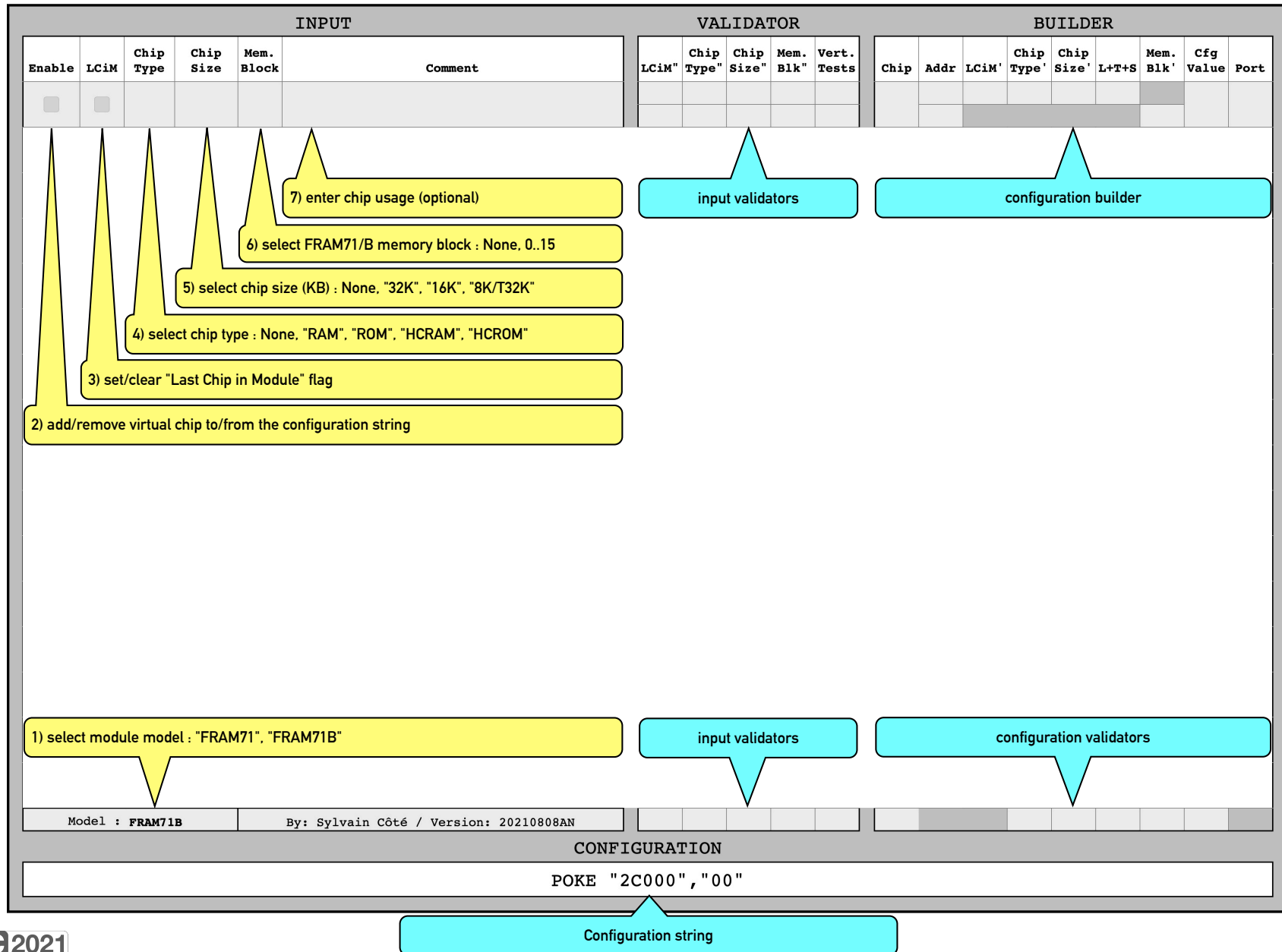
# Overview

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- The configurator spreadsheet allows users to create a valid configuration string for the FRAM71 or FRAM71B module.
- Compatible with :
  - Apple Numbers 11 for macOS
  - Microsoft Excel 2016 for Mac  
Should work on compatible versions of Excel for Windows.
- Available on The Museum of HP Calculators at :
  - HP Forum → Articles → FRAM71/B Configuration Spreadsheet
  - <https://www.hpmuseum.org/forum/thread-17299.html>

*Note: due to a bug in Microsoft Excel 2016 for Mac, the Excel spreadsheet version does not have conditional colour formatting for highlighting warnings and errors.*

# Spreadsheet Elements



# Valid Configuration Example

INPUT						VALIDATOR					BUILDER													
Enable	LCiM	Chip Type	Chip Size	Mem. Block	Comment	LCiM"	Chip Type"	Chip Size"	Mem. Blk"	Vert. Tests	Chip	Addr	LCiM'	Chip Type'	Chip Size'	L+T+S	Mem. Blk'	Cfg Value	Port					
<input checked="" type="checkbox"/>	<input type="checkbox"/>	RAM	32K	3	Two 32KB RAM chips test	5					0	2C000	0	0	1	1		13						
								1	3			2C001					3							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RAM	32K	4		5					1	2C002	8	0	1	9		94	5.00					
						LCiM		1	4			2C003					4							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ROM	32K	5	Two 32KB ROM chips test	9					2	2C004	0	4	1	5		55						
								1	5			2C005					5							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ROM	32K	6		9					3	2C006	8	4	1	D		D6	5.01					
						LCiM		1	6			2C007					6							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	RAM	16K	7	Two 16KB RAM chips test	13					4	2C008	0	0	2	2		27						
								2	7			2C009					7							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RAM	16K	8		13					5	2C00A	8	0	2	A		A8	5.02					
						LCiM		2	8			2C00B					8							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ROM	16K	9	Two 16KB ROM chips test	17					6	2C00C	0	4	2	6		69						
								2	9			2C00D					9							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ROM	16K	10		17					7	2C00E	8	4	2	E		EA	5.03					
						LCiM		2	10			2C00F					A							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	RAM	8K/T32K	11	Two 8KB RAM chips test	21					8	2C010	0	0	3	3		3B						
								3	11			2C011					B							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	RAM	8K/T32K	12		21					9	2C012	8	0	3	B		BC	5.04					
						LCiM		3	12			2C013					C							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ROM	8K/T32K	13	Two 8KB ROM chips test	25					A	2C014	0	4	3	7		7D						
								3	13			2C015					D							
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	ROM	8K/T32K	14		25					B	2C016	8	4	3	F		FE	5.05					
						LCiM		3	14			2C017					E							
<input type="checkbox"/>	<input type="checkbox"/>																							
<input type="checkbox"/>	<input type="checkbox"/>																							
<input type="checkbox"/>	<input type="checkbox"/>																							
<input type="checkbox"/>	<input type="checkbox"/>																							
Model : FRAM71				By: Sylvain Côté / Version: 20210808AN																				
CONFIGURATION																								
POKE "2C000", "139455D627A869EA3BBC7DFE00"																								

# Invalid Configuration Example

INPUT						VALIDATOR					BUILDER								
Enable	LCiM	Chip Type	Chip Size	Mem. Block	Comment	LCiM"	Chip Type"	Chip Size"	Mem. Blk"	Vert. Tests	Chip	Addr	LCiM'	Chip Type'	Chip Size'	L+T+S	Mem. Blk'	Cfg Value	Port
✓	✓	NEW	32K	3	Invalid chip type test	3	IVA				0	2C000	8	ERR	1	ERR			
						LCiM		1	3			2C001						3	
✓	✓	RAM	64G	4	Invalid chip size test	5		IVA			1	2C002	8	0	ERR	ERR			
						LCiM		36	4			2C003						4	
✓	✓	ROM	16K	6502	Invalid memory block test	7			IVA		2	2C004	8	4	2	E			
						LCiM		2	6502			2C005						ERR	
✓	☐	ROM	32K	5	Invalid chip type test 2 (two chips)	11						2C006	0	4	1	5			55
							ERR	1	5			2C007						5	
✓	✓	NEW	32K	6	Note: MCT was expected, ERR is also valid Edge case, should never happen.	11	IVA				4	2C008	8	ERR	1	ERR			
						LCiM		1	6			2C009						6	
✓	☐	RAM	32K	7	Invalid chip size test 2 (two chips)	15				MCS	5	2C00A	0	0	1	1			17
								1	7			2C00B						7	
✓	✓	RAM	64G	8		15		IVA			6	2C00C	8	0	ERR	ERR			
						LCiM		46	8			2C00D						8	
✓	☐	ROM	32K	6809	Invalid memory block test 2 (two chips)	19			IVA		7	2C00E	0	4	1	5			
								1	6809			2C00F						ERR	
✓	✓	ROM	32K	8080		19			IVA		8	2C010	8	4	1	D			
						LCiM		1	8080			2C011						ERR	
☐	☐																		
☐	☐																		
☐	☐																		
☐	☐																		
☐	☐																		
☐	☐																		
☐	☐																		
☐	☐				Invalid unit model test														
Model : CARD71				By: Sylvain Côté / Version: 20210808AN			ERR	ERR	ERR	ERR	IMO			ERR	ERR	ERR	ERR	ERR	

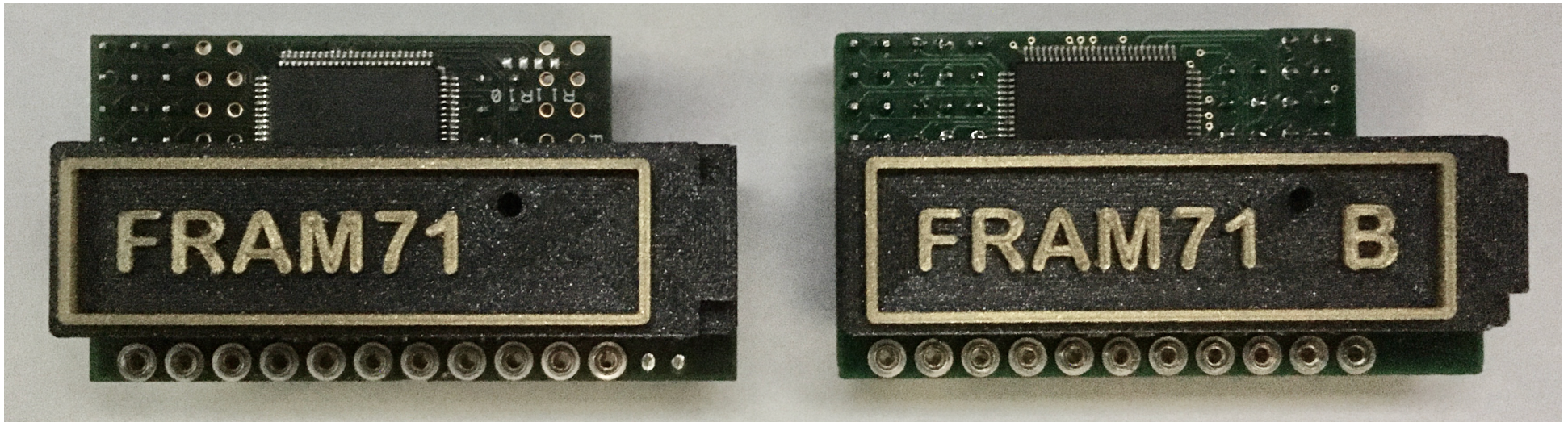
CONFIGURATION

ERROR

# Information Page

INPUT			BUILDER		
Col.	Title	Description	Col.	Title	Description
B	Enable	Enable the line to be part of the configuration string Checkbox: Uncheck or Check	O	Chip	Chip Number
C	LCiM	Last Chip in Module Checkbox: Uncheck or Check	P	Addr	Configuration Address Odd line : Chip Configuration Address Even line : FRAM Memory Block Address
D	Chip Type	Chip memory type PopUpMenu: None, "RAM", "ROM", "HCRAM", "HCROM" HCxxx: Hard-Configured address (0xE0000)	Q	LCiM'	Last Chip in Module
E	Chip Size	Chip memory size (KB) PopUpMenu: None, "32K", "16K", "8K/T32K" FRAM71: "8K/T32K" → 8K FRAM71B: "8K/T32K" → Top 32K FRAM memory chip	R	Chip Type'	Chip Type
F	Mem. Block	FRAM71/B memory block (aka F-Block) PopUpMenu: None, 0..15 (2 is reserved)	S	Chip Size'	Chip Size
G	Comment	Comment Text: free form field	T	L+T+S	Chip Configuration
			U	Mem. Blk'	FRAM Memory Block
			V	Cfg Value	Chip+FRAM Configuration Value
			W	Port	Module Port Number (5.XX)
Line	Title	Description	<b>CONFIGURATION</b>		
35	Model	Card Reader Module Model PopUpMenu: FRAM71B, FRAM71	Line	Title	Description
			37	CONFIGURATION	Configuration String
			38	WARNING	Warning message
VALIDATOR			ERRORS & WARNINGS		
Col.	Title	Description	ID	Name	Description
I	LCiM"	Last Chip in Module Validation Odd line : LCiM row calculator Even line : LCiM row marker Bottom line : Column Validator	ERR	Error	There is an error somewhere
J	Chip Type"	Chip Type Validation Odd line : Type Cell Validator Even line : Type Module Validator Bottom line : Column Validator	MVA	Missing Value	Value is missing, enter/select a value
K	Chip Size"	Size Validation Odd line : Chip Size Validator Even line : Normalized chip size used for MCS validation Bottom line : Column Validator	IVA	Invalid Value	Value is outside the allowed range
L	Mem. Blk"	Memory Block Validation Odd line : Memory type Validator Even line : Empty Bottom line : Column Validator	ICS	Invalid Chip Size	Hard-configured ROM is only compatible with 32KB
M	Vert. Tests	Vertical Validation Odd line : Duplicate Memory Block Validator Even line : Multiple Chip Size Validator Bottom line : Column Validator	ICN	Invalid Chip Number	Hard-configured ROM is only compatible with Chip 0
			IMO	Invalid Model	Unit model is either not specified or not supported
			RVA	Reserved Value	Value is reserved and cannot be used
			LLM	Last LCiM Missing	The last enabled chip must have LCiM field check
			MCT	Multiple Chip Type	You cannot use both RAM & ROM for the same module
			MCS	Multiple Chip Size	All chips in a module must be set to the same size
			DMB	Duplicate Memory Block	Mem. block number can only be used once in a conf.
			SYS	System RAM Memory Block	System RAM memory block is being used
			<b>RULES</b>		
			1) The Enable check box must be selected for the row to be in the configuration 2) A module is completed when the LCiM is enabled. 3) Mixing chip type within a module is not allowed. 4) Mixing chip size within a module is not allowed. 5) Mixing FRAM71B "32K" and "T32K" chip size within a module is allowed. 6) Memory block #2 (F-Block #2) is reserved and cannot be used 7) Hard configured address (0xE0000) can only be used with LCiM 32KB RAM Chip 0 Note: HCROM only works with F-Block 3 for FRAM71 with firmware v501 and less 8) System RAM configuration (F-Block #0 & #1) is not supported by the spreadsheet		

By: Sylvain Côté / Version: 20210808AN



# CONFIGURATOR SPREADSHEET LIVE DEMO