

F²MC 16-bit Family

- CAN 2.0B
- LIN-UART
- LCDC & VFD controller/driver
- Stepper motor control
- AC/DC motor control
- Embedded dual-operation Flash
- Wide range of package options

Fujitsu's family of F²MC-16LX series microcontrollers serve the entire CAN spectrum for automotive and industrial applications. The family includes a wide range of single, double, and triple CAN controllers combined with a rich peripheral feature set, making these MCUs suitable for body-electronics-network applications. Fujitsu's stepper motor controller embedded MCUs feature up to six stepper motor controllers in a single device, making them ideal for dashboard applications.

F²MC-16LX Application Coverage

Automotive: Body control networks, dashboards, chassis networks

White Goods: Washing machines, refrigerators

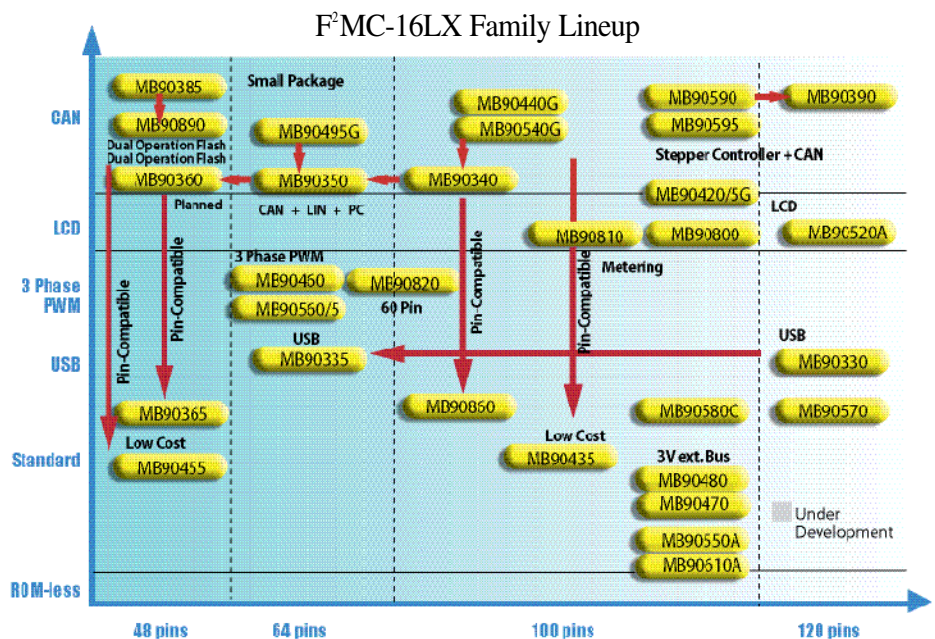
Industrial & Home Automation: Utility meters, heating/air-conditioning systems

Consumer: Digital cameras, handheld electronic products for audio/video display control

Fujitsu's broad spectrum of 16-bit microcontrollers covers general-purpose and application-specific types with a rich variety of features, including the latest technologies such as dual-operation Flash memory.

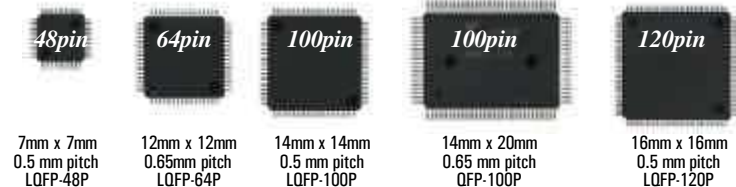
Fujitsu's F²MC-16LX 16-bit microcontroller series provides CAN (Controller Area Network) and LIN (Local Interconnect Network) interfaces, and a wide range of Flash memory for consumer, industrial, and automotive body-control applications.

Fujitsu has developed the world's first embedded dual-operation Flash microcontrollers. The dual-operation Flash memory in a single chip enables simultaneous read/write processing. This offers a significant performance advantage over conventional Flash architectures, in which all data configurations need to be written and stored on an external EEPROM or other non-volatile memory when the device powers down.

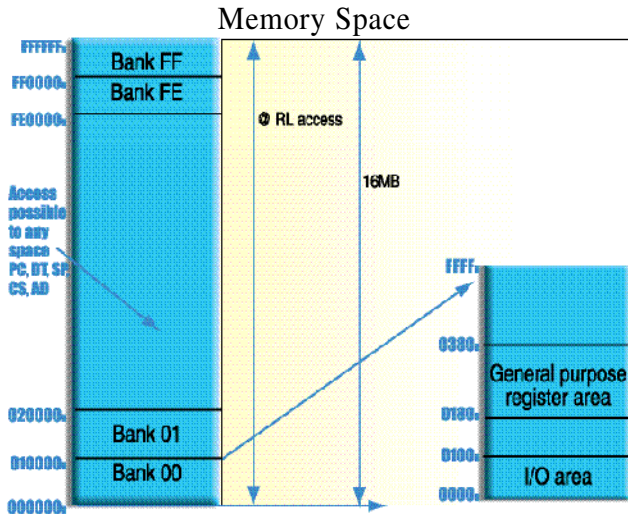


Wide Range of Package Lineup

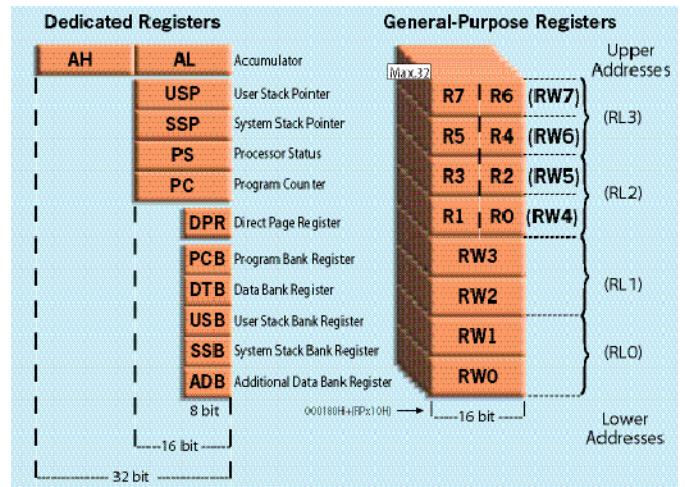
Fujitsu pioneered packaging technology which provides flexible packages ranging from 48 pin to 120 pins.



F²MC 16-bit Family

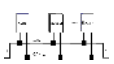






F²MC-16LX Architecture



One obvious strength of this 16-bit architecture is its excellent code efficiency. Fujitsu has a long record in compiler technology, dating back to the early days of mainframe computers, so it was a logical move not only to equip the 16LX architecture with an instruction set that is C-code optimized, but also to supply the actual C-compiler that draws on this architectural strength enabling flexible addressing options, for example. Bank registers for program code and data allow the use of 16-bit addresses, thus reducing code size while at the same time increasing processing performance.

Peripheral Features

	<ul style="list-style-type: none"> Up to 3 channels of CAN 16 message buffers Suitable for low- and high-speed CAN applications 	<ul style="list-style-type: none"> Individually programmable TX and RX buffers, CAN wake-up & multilevel message buffer features make the devices flexible.
	<ul style="list-style-type: none"> Offers low-cost reliable network 	<ul style="list-style-type: none"> Suitable for distributed electronic systems in vehicles. LIN enables cost-effective communication systems where high-bandwidth and versatility of CAN are not required.
	<ul style="list-style-type: none"> Single chip MCU with 6ch SMC Multifunction timer and waveform generator for motor control High-speed ADC up to 24ch 	<ul style="list-style-type: none"> Integrated stepper motor driver I/O enables designer to reduce BOM cost. Integrated multifunction timer for dead time creation simplifies development for motor control applications.
	<ul style="list-style-type: none"> Embedded VFDC & LCDC 	<ul style="list-style-type: none"> MCUs support large VFD of up to 896 segments. MCUs with LCDC support up to 152 pixels LCD display. These features make this family attractive for A/V display applications.
	<ul style="list-style-type: none"> Full speed USB mini-host & device function 	<ul style="list-style-type: none"> 12Mbps USB interface, with simple host features, enables direct communication without a host PC.

F²MC 16-bit Family

F ² MC-16LX MCU Family																								
Series	Pin Count	Vcc Volts	ROM KB	ROM Type	RAM KB	Clock MHz (kHz)	Max I/O	Ext Bus I/F	Ext. Inter	Input Capture	Output Compare	ADC 10bit ch	Timer 16bit ch	PPG 16bit ch	SIO 8bit ch	I ² C ch	UART ch	LIN-UART	CAN 2.0B ch	Stepper Motor Controller ch	AC Motor Control	LCDC (Segx Com)	Special Features	
MB90330A	120	3	256 to 384	Mask, Flash	16 to 24	24 (32)	94	Yes	8	4	4	16	3	3	1	3	4						USB mini-host, USB function	
MB90335	64	3	64	Mask, Dual Op. Flash	4	24 (32)	45	No	8	4	4	0	3	3	1	1	2						USB mini-host, USB function	
MB90340	100	5	64 to 512	Mask, Flash	2 to 20	24 (32)	80	Yes	16	8	8	16 to 24	4	8		0 to 2	4	Yes	1 to 2				CAN, LIN, I ² C	
MB90350	64	5	64 to 128	Mask, Flash	2 to 4	24 (32)	49	Yes	8	6	4	15	4	6		1	2	Yes	1				CAN, LIN, 15ch ADC, low voltage detect	
MB90355	64	5	64 to 128	Mask, Dual Op. Flash	2 to 4	24 (32)	49	Yes	8	6	4	15	4	6		1	2	Yes	1				CAN, LIN, low voltage detect, clock monitor function, internal RC oscillator	
MB90360	48	5	64	Mask, Flash	2 to 4	24 (32)	49	No	8	6	0	16	2	2			2	Yes	1				CAN, LIN, 16ch ADC, low voltage detect, dual-op. Flash	
MB90370/378	144	3	64 to 128	Mask, Flash	6	16 (32)	120	No	6	0	0	12	4	3		2	3						9x4 LPC, PS/2 I/F, bit decoder	
MB90385	48	5	64	Mask, Flash	2	16 (32)	34	No	4	4	0	8	2	2			1		1				compact device with CAN	
MB90390	120	5	384	Flash	10	24	96	No	8	6	8	8	2	6	1		3		2	6			6ch stepper motor controllers, CAN, sound generator	
MB90M405	100	3	96 to 128	Mask, Flash	4	16	26	No	4	2	1	16	3			1	2						VFD I/F	
MB90420G	100	5	64 to 128	Mask, Flash	6	16 (32)	58	No	8	4	0	8	2	3			2		2	4		24x4	LCDC, 4ch Stepper motor controller, 2ch CAN	
MB90425G	100	5	64 to 128	Mask, Flash	4 to 6	16 (32)	58	No	8	4	0	8	2	3			2		1	4		24x4	LCDC, 4ch stepper motor controller, 1ch CAN	
MB90435	100	5	64 to 128	Mask, Flash	2 to 6	16 (32)	81	Yes	8	6	4	8	2	2	1		2							
MB90440G	100	5	128	Mask, Flash	6	16 (32)	81	Yes	8	8	2	8	2	4	1		2		3					3 ch CAN gateway
MB90455	48	5	24 to 64	Mask, Flash	2	16 (32)	36	No	4	4	0	8	2	2			1							compact, low-cost
MB90460	64	5	64	Mask, Flash	2	16	50	No	8	4	6	8	2	3			2				Yes		multi-pulse generator, inverter motor control	
MB90470	100	3	128 to 256	Mask, Flash	8 to 16	20 (32)	84	Yes	8	2	6	8	1	3	2	1	1							
MB90480/485	100	3	192 to 384	Flash, Mask	4 to 24	25 (32)	84	Yes	8	2	6	8	1	3	2	1	1							
MB90495G	64	5	64 to 128	Mask, Flash	2	16 (32)	49	Yes	8	4	0	8	2	1			2		1					
MB90520B	120	5	64 to 128	Mask, Flash	4	16 (32)	85		8	2	8	8	2	1	2		1					32x4	96 elements LCDC, DAC, ADC	
MB90540G	100	5	128	Mask, Flash	6	16 (32)	81	Yes	8	6	4	8	2	1	1		2		2				2ch CAN, external bus I/F	
MB90545G	100	5	64 to 256	Flash	2 to 6	16 (32)	81	Yes	8	6	4	8	2	1	1		2		1				1ch CAN, external bus I/F	
MB90550A/B	100	5	0 to 128	Mask, OTP, Flash, ROMless	2 to 4	16	83	Yes	8	4	4	8	2	3	2	2	1							
MB90560	64	5	32 to 64	Mask, Flash	1 to 4	16	50	No	8	4	6	8	2				2				Yes		waveform generator, inverter motor control	
MB90565	64	3	96 to 128	Mask, Flash	4	16	50	No	8	4	6	8	2				2				Yes		waveform generator, inverter motor control	
MB90570A/C	120	5	120 to 256	Mask, Flash	6 to 10	16 (32)	97	Yes	8	2	4	8	0	1	3	1	2							IE Bus I/F
MB90580/585	100	5	64 to 256	Mask, Flash	4 to 6	16 (32)	77	Yes	8	4	2	8	3	1			5							
MB90590G	100	5	256 to 384	Mask, Flash	8	16	78	No	8	6	6	8	2	6	1		3		2	4				CAN, 4ch stepper motor, sound generator
MB90595G	100	5	128	Mask, Flash	4	16	78	No	8	4	4	8	2	6	1		2		1	4				CAN, 4ch stepper motor
MB90800	100	3	128 to 256	Mask, Flash	4 to 16	25 (32)	68	No	4	2	2	12	3	2	2	1	2					48x4	192 elements LCDC, I ² C	
MB90820	80	5	64 to 128	Mask, Flash	4	24	66	Yes	8	4	6	16	2	3			2				Yes		high-speed ADC, multi-function timer, waveform generator	
MB90860A	100	5	128	Mask, Flash	6	24 (32)	83	Yes	16	8	8	24	4	8		2	4	Yes	1				dual-op. Flash	
MB90895	48	5	64	Dual Op. Flash	2	16 (32)	36	No	16	8	8	8	2	2			2		1					CAN, dual-op. Flash
MB90945	100	5	128 to 256	Flash	6 to 12	24	83	Yes	16	4	0	15	1	6	1	1	2	Yes	1					CAN, LIN



F²MC-16 bit Family

F²MC-16LX AC/DC Motor Control Device Series

Series	Pin Count	Vcc Volts	ROM KB	ROM Type	RAM KB	Clock MHz(kHz)	Max I/O	Ext Bus I/F	Ext. Inter.	Input Capture	Output Compare	ADC 10bit ch	Timer 16bit ch	PPG 16bit ch	UART ch	AC Motor Control	Special Features
MB90460	64	5	64	Mask, Flash	2	16	50	No	8	4	6	8	2	3	2	Yes	multi-pulse generator, inverter motor control
MB90560	64	5	32 to 64	Mask, Flash	1 to 4	16	50	No	8	4	6	8	2		2	Yes	waveform generator, inverter motor control
MB90565	64	3	96 to 128	Mask, Flash	4	16	50	No	8	4	6	8	2		2	Yes	waveform generator, inverter motor control
MB90820	80	5	64 to 128	Mask, Flash	4	24	66	Yes	4	4	6	16	2	3	2	Yes	High speed ADC, multi-function timer, waveform generator

F²MC-16LX CAN and Stepper Motor Controller Series

Series	Pin Count	Vcc Volts	ROM KB	ROM Type	RAM KB	Clock MHz (kHz)	Max I/O	Ext Bus I/F	Ext. Inter.	Input Capture	Output Compare	ADC 10bit ch	Timer 16bit bch	PPG 16bit ch	SIO 8bit ch	I2C ch	UART ch	LIN- UART	CAN 2.0B ch	Stepper Motor Controller	LCDC (SegxCom)	Special Features	
MB90340	100	5	64 to 512	Mask, Flash	2 to 20	24 (32)	80	Yes	16	8	8	16 to 24	4	1		0 to 2	4	Yes	1 to 2			LIN-UART	
MB90350	64	5	64 to 128	Mask, Flash	2 to 4	24 (32)	49	Yes	8	6	4	15	4	1			2	Yes	1				
MB90355	64	5	64 to 128	Mask, Dual Op. Flash	2 to 4	24 (32)	49	Yes	8	6	4	15	4	1			2		1				LIN-UART, low voltage detect, clock monitor function
MB90360	48	5	64	Mask, Flash	2 to 4	24 (32)	49	No	8	6	0	15	4	1			2		1				LIN-UART, low voltage detect, dual-op. Flash
MB90385	48	5	64	Mask, Flash	2	16 (32)	34	No	4	4	0	8	2	4			1		1				
MB90390	120	5	384	Flash	10	24	96	No	8	6	8	8	2	6	1	1	3		2	6			6ch stepper motor controller, large Flash
MB90420G	100	5	64 to 128	Mask, Flash	6	16 (32)	58	No	8	4	0	8	2	3			2		2	4	24		
MB90425G	100	5	64 to 128	Mask, Flash	4 to 6	16 (32)	58	No	8	4	0	8	2	3			2		1	4	24		
MB90440G	100	5	128	Mask, Flash	6	16 (32)	81	Yes	8	8	2	8	2	4	1		2		3				3ch CAN gateway
MB90495G	64	5	64 to 128	Mask, Flash	2	16 (32)	49	Yes	8	4	0	8	2	2			1		1				
MB90540G	100	5	128	Mask, Flash	6	16 (32)	81	Yes	8	6	4	8	2	4	1		2		2				
MB90545G	100	5	64 to 256	Flash	2 to 6	16 (32)	81	Yes	8	6	4	8	2	4	1		2		1				
MB90590G	100	5	256 to 384	Mask, Flash	8	16	78	No	8	6	6	8	2	6	1		3		2	4			
MB90595G	100	5	128	Mask, Flash	4	16	78	No	8	4	4	8	2	6	1		2		1	4			
MB90895	48	5	64	Dual Op. Flash	2	16 (32)	36	No	16	4		8	2	2		1	2		1				dual-op. Flash
MB90945	100	5	128 to 256	Flash	6 to 12	24	83	Yes	16	4		8	2	2		1	2		1				

FUJITSU MICROELECTRONICS AMERICA, INC.

1250 E. Arques Avenue, MS333, Sunnyvale, CA 94088-3470

Tel: (800) 866-8608 Fax: (408) 737-5999

http://us.fujitsu.com/micro, Email: inquiry@fma.fujitsu.com

© 2006 Fujitsu Microelectronics America, Inc.
All company and product names are trademarks or registered trademarks of their respective owners.

Printed in the U.S.A. MCU-FS-21133-3/2006