



78K0R/Kx3 Microcontroller

Sample Program

Operation Manual

**(3-Wire Serial I/O (Master Transmission/Reception, Single
Transmission/Reception Mode) (Serial Array Unit), ASM Source)**

This software is for reference only and NEC Electronics does not guarantee its operation.
Thoroughly evaluate this software on your set prior to use.

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1. OVERVIEW

This manual explains the sample program functions of 3-wire serial I/O processing (master transmission/reception (single transmission/reception mode)).

In this sample program, master transmission/reception (single transmission/reception mode) operation in 3-wire serial I/O communication is performed.

The communication conditions are as follows.

- $f_{CLK} = 8 \text{ MHz}$
- CSI00 (unit 0, channel 0) is used.
- 9,600 bps, 8-bit data
- LSB first
- Number of transmit data: 10
- Transmit data: 3A
- INTCSI00 transfer end interrupt servicing is used.

2. RESOURCES USED

Resource	Description	Remark
Main clock specification	Internal high-speed oscillator used (8 MHz (TYP.))	Supplied to CPU and peripheral hardware
	High-speed system clock used (20 MHz)	Oscillated by initial processing
Subclock	XT1 (32.768 kHz)	Oscillated by initial processing
Related hardware	Peripheral enable register 0 (PER0)	
	Serial clock select register 0 (SPS0)	Clock used: CKm0 (1/2 ⁴ of main clock), 0.5 MHz (2 μ s)
	Serial mode register 00 (SMR00)	
	Serial communication operation setting register 00 (SCR00)	Executes transmission/reception. Data length: 8 bits
	Serial data register 00 (SDR00)	Transfer rate: 9,600 bps
	Serial flag clear trigger register 00 (SIR00)	Used to clear an error flag.
	Serial channel start register 0 (SS0)	
	Serial channel stop register 0 (ST0)	
	Serial output register 0 (SO0)	
	Serial output enable register 0 (SOE0)	
	Port mode register 1 (PM1)	
	Port register 1 (P1)	
	SIO00 register (SIO20)	
I/O	Input: P11 (data input) Output: P10 (clock output), P12 (data output)	
Interrupt	Not used	
Others	Not used	

3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline
K0R_vct.asm	Vector processing
K0R_init.asm	Initialization processing
K0R_main.asm	Main processing
K0R_sfr_set.asm	3-wire serial I/O processing Master transmission/reception (single transmission/reception mode)

4. FUNCTION EXPLANATIONS

[File name]

K0R_main.asm

Function

Function Name	Processing Outline	Argument	Return Value
MMA_STRT	Main routine	None	None

Function explanations

Function name	MMA_STRT
Processing	Main routine
Argument	–
Return value	–
Description	Executes initialization processing and then starts transmission/reception operation. Aborts the operation after reception completion and resumes the operation after a specific time has elapsed.
Remark	–

[File name]

K0R_sfr_set.asm

Functions

Function Name	Processing Outline	Argument	Return Value
SER_MTRIN	Initializes 3-wire serial I/O.	None	None
SER_MTRST	Starts 3-wire serial I/O operation.	None	None
SER_MTRBK	Aborts 3-wire serial I/O operation.	None	None
SER_MTRRE	Resumes 3-wire serial I/O operation.	None	None
SER_MTRSP	Stops 3-wire serial I/O operation.	None	None
SER_MTRIT	3-wire serial I/O transmission/reception	None	None

Function explanations

Function name	SER_MTRIN
Processing	Initializes 3-wire serial I/O.
Argument	–
Return value	–
Description	Executes initialization.
Remark	–

Function name	SER_MTRST
Processing	Starts 3-wire serial I/O operation.
Argument	–
Return value	–
Description	Starts transmission/reception operation.
Remark	–

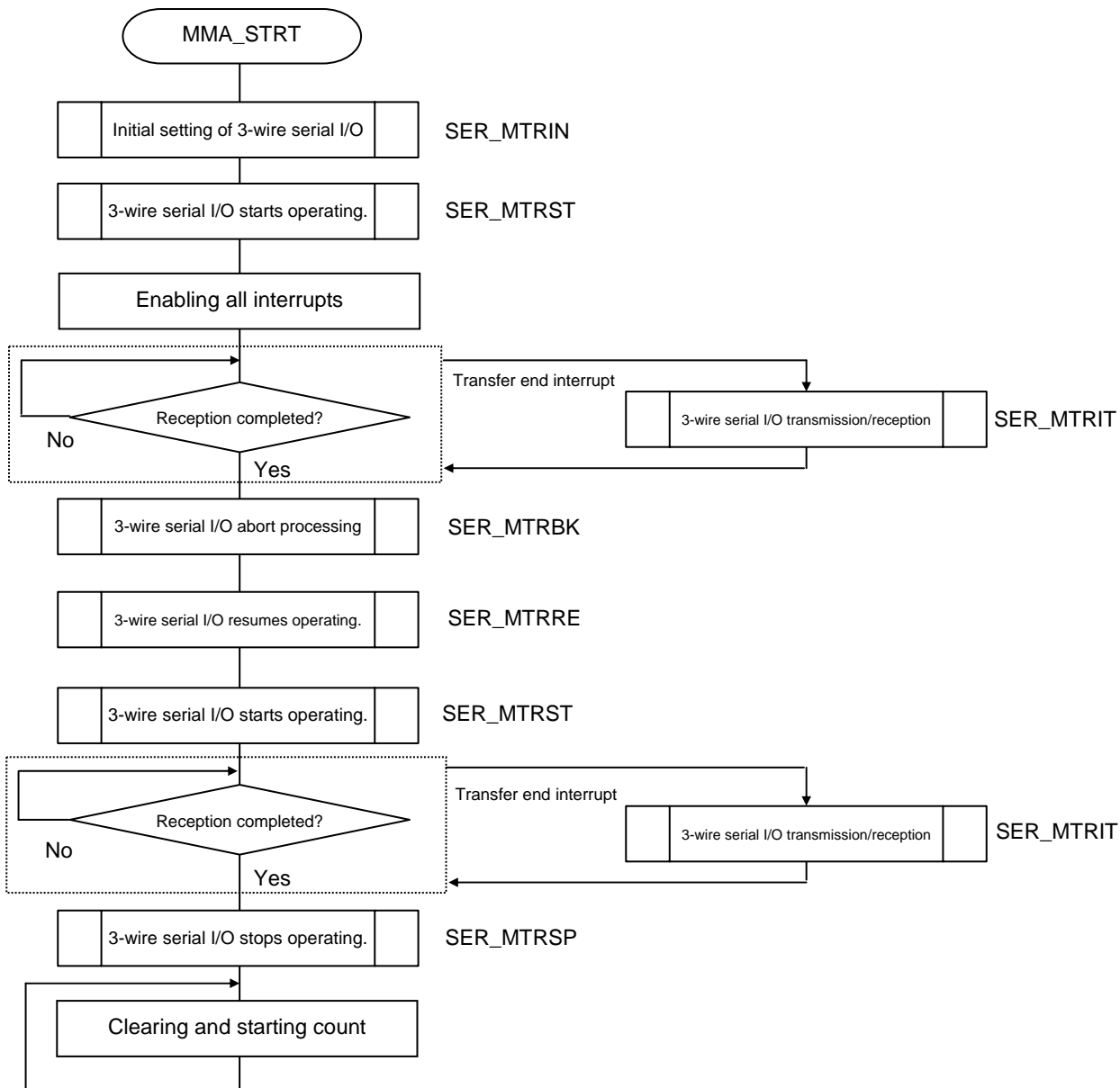
Function name	SER_MTRBK
Processing	Aborts 3-wire serial I/O operation.
Argument	–
Return value	–
Description	Transits to a communication operation stop state.
Remark	–

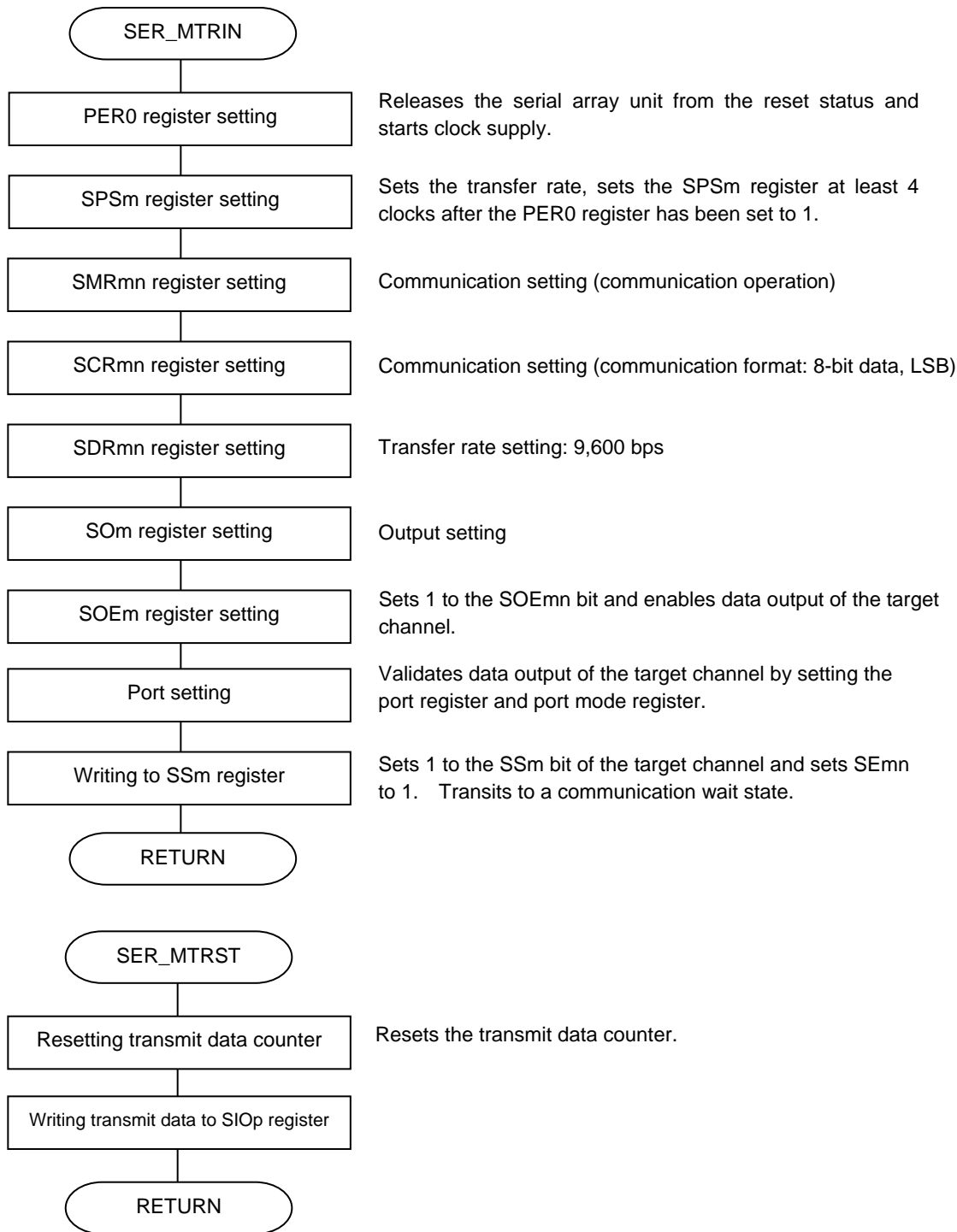
Function name	SER_MTRRE
Processing	Resumes 3-wire serial I/O operation.
Argument	–
Return value	–
Description	Resumes transmission/reception operation.
Remark	–

Function name	SER_MTRSP
Processing	Stops 3-wire serial I/O operation.
Argument	–
Return value	–
Description	Stops clock supply.
Remark	–

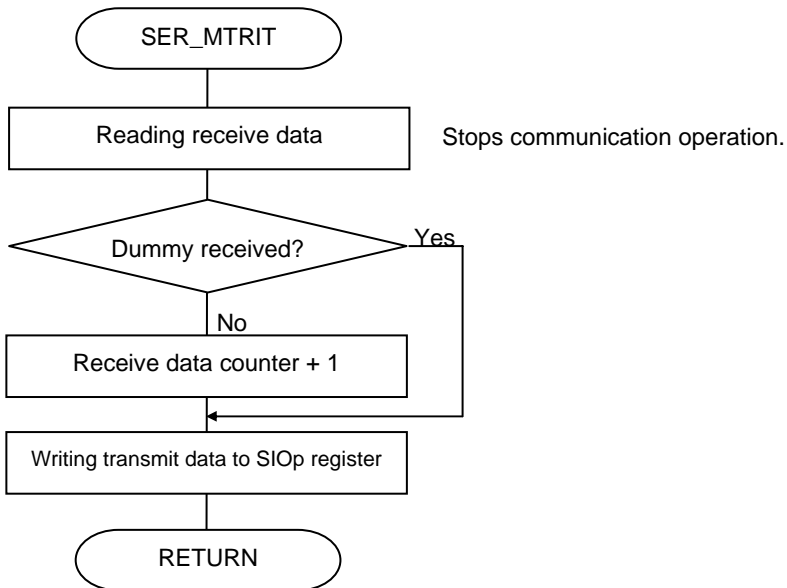
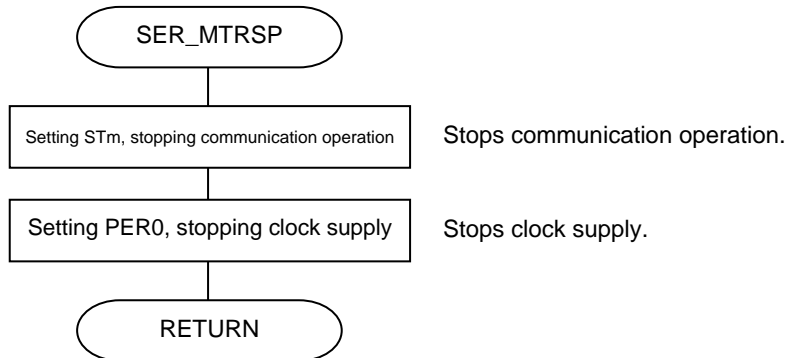
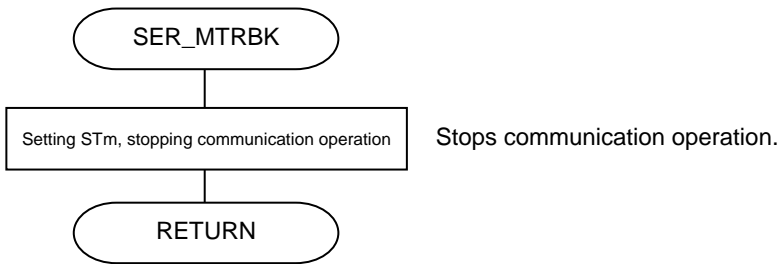
Function name	SER_MTRIT
Processing	3-wire serial I/O transmission/reception
Argument	–
Return value	–
Description	<p>INTCSI00 transfer end interrupt servicing</p> <p>An interrupt is generated when transfer has been completed.</p> <p>When this interrupt is generated, the receive data is read and transmit data is set.</p>
Remark	–

5. FLOWCHARTS

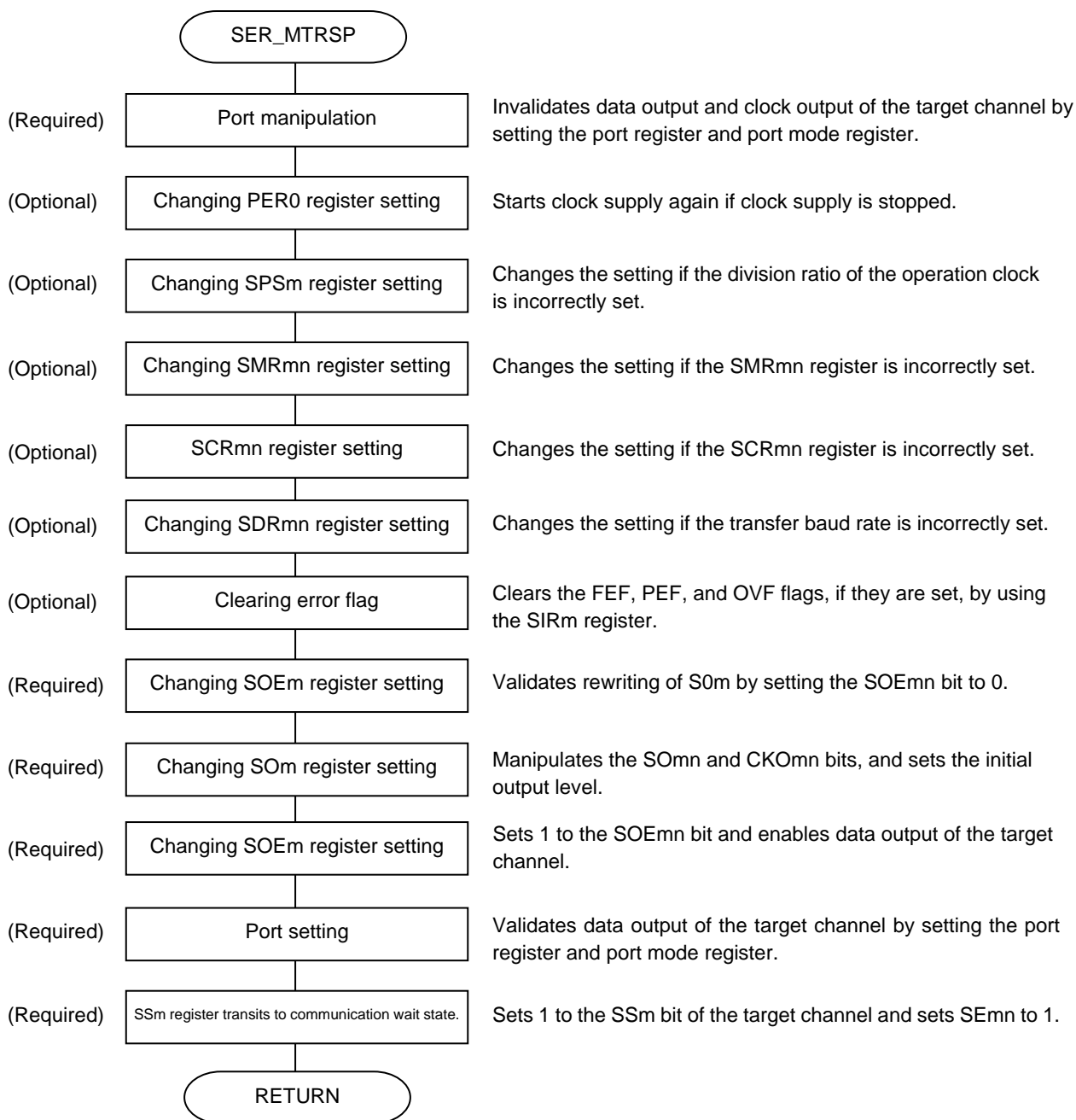




Remark m: Unit number (m = 0, 1), n: Channel number (n = 0 to 3), p: CSI number (p = 00, 01, 10, 20)
 m = 0, n = 0, p = 00 for this sample program.



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