



# **78K0R/Kx3 Microcontroller Sample Program Operation Manual (UART Continuous Transmission (Serial Array Unit), ASM Source)**

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1st Product Solution Group, Multipurpose Microcomputer Systems Division,  
Microcomputer Operations Unit  
NEC Electronics Corporation

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## CONTENTS

1. OVERVIEW.....	4
2. RESOURCES USED .....	5
3. SOFTWARE CONFIGURATION.....	6
4. FUNCTION EXPLANATIONS .....	7
5. FLOWCHARTS.....	9

## 1. OVERVIEW

This manual explains the sample program functions of UART (continuous transmission mode) for the 78K0R/Kx3.

In this sample program, UART (continuous transmission mode) operation is performed.

The communication conditions are as follows.

- $f_{CLK} = 20 \text{ MHz}$
- UART0 (unit 0, channel 0) is used.
- 9,600 bps, 8-bit data, stop bit: 1, no parity
- LSB first
- Number of transmit data: 10 bytes
- Transmit data: 3AH
- INTST0 transfer end interrupt servicing is used.

2. RESOURCES USED

Resource	Description	Remark
Main clock specification	Internal high-speed oscillator used (8 MHz (TYP.))	Always oscillated
	High-speed system clock used (20 MHz)	Oscillated by initial processing. Supplied to CPU and peripheral hardware
Subclock	XT1 (32.768 kHz)	Oscillated by initial processing
Related hardware	Peripheral enable register 0 (PER0)	
	Serial clock select register 0 (SPS0)	Clock used: CK00 (1/2 <sup>4</sup> of main clock), 1.25 MHz (0.8 μs)
	Serial mode register 00 (SMR00)	
	Serial communication operation setting register 00 (SCR00)	Transmission only, data length: 8 bits
	Serial data register 00 (SDR00)	Transfer rate: 9,600 bps
	Serial output level register 0 (SOL0)	Sets output data level.
	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)	
I/O	Data output: TxD0 (P12)	
Interrupt	Transfer end interrupt (INTST0) of UART0	
Others	Not used	

### 3. SOFTWARE CONFIGURATION

Files

File Name	Processing Outline	Remark
K0R_vct.asm	Vector processing	
K0R_init.asm <sup>Note</sup>	Initialization processing	
K0R_main.asm	Main processing	
K0R_sfr_set.asm	UART (continuous transmission mode)	

**Note** This file is commonly used by the sample programs.

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 operation.
Remark	–

[File name]

K0R\_sfr\_set.asm

Functions

Function Name	Processing Outline	Argument	Return Value
UAR_CSIN	Initializes UART.	None	None
UAR_CSST	Starts UART operation.	None	None
UAR_CSSP	Stops UART operation.	None	None
UAR_CSIT	UART transmission interrupt servicing	None	None

Function explanations

Function name	UAR_CSIN
Processing	Initializes UART.
Argument	–
Return value	–
Description	Executes initialization.
Remark	–

Function name	UAR_CSST
Processing	Starts UART operation.
Argument	–
Return value	–
Description	Starts transmission operation.
Remark	–

Function name	UAR_CSSP
Processing	Stops UART operation.
Argument	–
Return value	–
Description	Stops transmission operation and stops clock supply.
Remark	–

Function name	UAR_CSIT
Processing	INTST0 transfer end interrupt servicing
Argument	–
Return value	–
Description	<p>The initial start condition is a buffer empty interrupt.</p> <p>An interrupt is generated when 1-byte data has been transmitted.</p> <p>As soon as processing of the transmit data has been completed, interrupt is switched to the transfer end interrupt, and the transmission processing is completed when the next transmission interrupt is generated.</p>
Remark	–

5. FLOWCHARTS







