

PAN4620

IEEE[®] 802.15.4 and Bluetooth[®] Low Energy Module Quick Start Guide

Rev. 1.1



Wireless Modules

Overview

The PAN4620 is Panasonic's Internet of Things dual mode module comprising NXP[®]'s Kinetis[®] MKW41Z512CAT4 SoC – a 2.4 GHz 802.15.4 and Bluetooth Low Energy (LE) wireless radio microcontroller based on an ARM[®] Cortex[®]-M0+ core.

Features

- UART, SPI, I²C, TSI, ADC, and DAC
- Same form factor and compatible pinout for VCC, GND, Reset, UART, I²C, and SWD as PAN1026, PAN1760, PAN1760A, and PAN1761
- Single and concurrent operation of IEEE 802.15.4 and Bluetooth LE
- Open to various known application layers or proprietary solutions
- Surface Mount Type dimensions: 15.6 mm x 8.7 mm x 1.9 mm
- On module 32 MHz and 32 kHz crystal
- SoC: NXP Kinetis KW41Z 2.4 GHz 802.15.4 and Bluetooth LE 4.2 Wireless Radio Microcontroller
- Core: Up to 48 MHz 32 bit ARM Cortex-M0+
- Memory: 512 kB of flash and 128 kB of SRAM
- Voltage range: 1.8 V to 4.2 V
- Temperature range: -40 °C to 85 °C

Characteristics

- Transceiver frequency range 2 360 MHz to 2 483.5 MHz
- Programmable transmitter output power: -30 dBm to 3 dBm
- Receiver sensitivity (Bluetooth LE): -93 dBm
- Receiver sensitivity typical for IEEE Standard 802.15.4: -98 dBm
- Typical receiver current consumption (3.6 V supply): 8.5 mA
- Transmitter current consumption (3.6 V supply, 0 dBm): 7.6 mA

Bluetooth

- Bluetooth LE 4.2 compliant implementation certified by Bluetooth SIG
- Supporting software consisting of Bluetooth LE host stack and profiles and IPv6 over Bluetooth LE
- Bluetooth Developer Studio Plug-In

IEEE 802.15.4

- IEEE standard 802.15.4 compliant
- Supporting software consisting of 802.15.4 MAC/PHY implementation, Simple Media Access Controller (SMAC), and NXP's certified Thread[®] and Zigbee[®] stacks are available.

Block Diagram



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1 About This Document

1.1 Purpose and Audience

This Quick Start Guide applies to the IEEE 802.15.4 and Bluetooth Low Energy development platform PAN4620 USB. The intention is to enable our customers to easily integrate our module PAN4620 in their product. This guide describes the needed software and gives useful hints. The product is referred to as "The PAN4620" or "the module" within this document.

1.2 Revision History

Revision	Date	Modifications/Remarks	
1.0	2019-02-18	1st version	
1.1	2019-04-15	Changed revision number "0.1" to "1.0". Editorial updates. Added chapter "Using Test Tool 12" (NXP Test Tool 12 Quick Start procedure). Updated chapter "Using SDK in MCUXpresso IDE" to new MCUXpresso version 10.3.1_2233.	

1.3 Use of Symbols

Symbol	Description
	Note
U	Indicates important information for the proper use of the product. Non-observance can lead to errors.
^	Attention
	Indicates important notes that, if not observed, can put the product's functionality at risk.
	Тір
<i>U</i>	Indicates useful information designed to facilitate working with the PAN4620.
⇒ [chapter number]	Cross reference
[chapter title]	Indicates cross references within the document.
	Example:
	Description of the symbols used in this document \Rightarrow 1.3 Use of Symbols.
\checkmark	Requirement
	Indicates a requirement that must be met before the corresponding tasks can be completed.
→	Result
	Indicates the result of a task or the result of a series of tasks.

1 About This Document

Symbol	Description
This font	GUI text
	Indicates fixed terms and text of the graphical user interface.
	Example:
	Click Save.
Menu > Menu item	Path
	Indicates a path, e.g. to access a dialog.
	Example:
	In the menu, select File > Setup page.
This font	File names, messages, user input
	Indicates file names or messages and information displayed on the screen or to be selected or entered by the user.
	Examples:
	pan1760.c contains the actual module initialization.
	The message Failed to save your data is displayed.
	Enter the value Product 123.
Key	Кеу
-	Indicates a key on the keyboard, e.g. F10 .

1.4 Related Documents

Please refer to the Panasonic website for more information as well as related documents \Rightarrow 6.2.2 Product Information.

2 Overview

The PAN4620 USB is a development platform for the PAN4620 IEEE 802.15.4 and Bluetooth LE module to implement Bluetooth and IEEE 802.15.4 functionality into various electronic devices.

This guide will describe how to start up the evaluation board, get all needed software sources, execute example code and build own implementations.

Please refer to the Panasonic website for related documents \Rightarrow 6.2.2 Product Information. Further information on the variants and versions \Rightarrow 6.1 Ordering Information.

3 PAN4620 USB Evaluation-Board Overview

3 PAN4620 USB Evaluation-Board Overview

3.1 Building Block Overview



3.2 Architecture Overview





3 PAN4620 USB Evaluation-Board Overview

3.3 Breakout Pins



3.4 Configuration Settings

Jumper	Topview	Description	Detail		
J1 1 5 V from USB connected		5 V from USB connected	5 V power option, to power the board from USB or the $5 V$ pin. The $5 V$ from USB can also be used to power the sensor board.		
		5 V from or to breakout pin connected			
J3	3	Module reset connected	If there is no firmware on the module, the reserved will be pulled low. This has to be considered		
	3 Module reset disconnected	Module reset disconnected	when the module is sharing a common reset with other components.		

3 PAN4620 USB Evaluation-Board Overview

Jumper	Topview	Description	Detail		
J4		SWD connected	Access to module and programmer SWD.		
		SWD disconnected			
J8		Module UART connected	Access to module UART RX and TX.		
		Module UART disconnected			
J9	9	Module VCC connected	Module VCC connection and GND pin. The module VCC jumper can be removed for current measurements.		
J7, J10		FTDI connected to module UART	Option for module UART to breakout pin or FTDI. Place jumpers either on J7 or J10.		
		Breakout pin connected to module UART			
J11 🖍	11	3.3 V are supplied to the breakout pin	Option to power an external sensor board sensor with 3.3 V. Do not place this jumper, if		
	11 .	3.3 V are not supplied to the breakout pin	an external 3.3 V source is present.		
R32, R48			These 0 Ω resistors can be removed, to disconnect the LEDs in case the IOs PTB0, PTC1, PTA18, and PTA19 shall be used for other purposes.		
SW2, SW3			If you want to use PTC4 and PTC5 for other purposes, do not push the buttons.		

After each different configuration the reset button needs to be pressed.

(i)

4.1 Jumper Start up Configuration

Place all highlighted jumpers on PAN4620 evaluation board. Connect the device via USB cable to a PC, to power it and run demo examples.



4.2 **Device Drivers**

4.2.1 General

It might be necessary to install drivers for some components.

Please note that the "FTDI USB UART" and the "Segger J-Link" SWD debugger will provide COM ports to the system.



On the PAN4620 USB evaluation board both COM ports can be used to open a UART connection to the PAN4620 module.

4.2.2 FTDI USB UART



Having the drivers installed correctly is mandatory for all the examples mentioned in this Quick Start Guide.

Depending on the operating system that is used, drivers for the "FTDI USB UART" might not be installed automatically. If in doubt, please check the FTDI website and install the drivers manually.

For further information please visit https://www.ftdichip.com/Drivers/VCP.htm.

4.2.3 Segger J-Link SWD Debugger

Depending on the operating system that is used, drivers for "Segger J-Link" SWD debugger might not be installed automatically. Having the drivers installed correctly is not strictly mandatory for the basic example mentioned in this Quick Start Guide, but necessary for using other software examples from NXP SDK.

If in doubt, please check the "Segger" website and install the drivers manually.

For further information please visit https://www.segger.com/downloads/jlink/.

4.3 Using Initial Bluetooth Heart Rate Example on PAN4620 USB

The PAN4620 evaluation board is coming with preinstalled Bluetooth Low Energy demo example.

Run the first demo

- 1. Download the app **IoT-Toolbox** from Google Play or Apple iTunes Store.
- 2. Start the app **IoT-Toolbox**.
- 3. Select the icon 😎 Heart Rate.



- 4. Switch on Bluetooth on Smartphone/Tablet.
- 5. Press the button SW3 on PAN4620-ETU to start advertising.
- 6. Scan for devices on Smartphone/Tablet.
- 7. Select and connect to the found device (e.g. **FSL_HRS**).



- 8. Press the button SW2 on the PAN4620-ETU to send changed heart rate data.
 - → See heart rate changes on Smartphone/Tablet.

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÷	IoT Toolbox Heart Rate	DISCONNECT			
	390				
	bpm				
	Sensor Loc	ation			
	Ches	st			
300 200	$\sim \sim \sim$	M			
100	15	30			
	NX				
Status:	Connected	100% 📼			

4.4 Getting NXP MCUXpresso IDE for PAN4620 Module

The following requirements must be met:

- ✓ Created user account on NXP website
 - 1. Visit the website <u>www.nxp.com</u>.
 - 2. Search for MCUXpresso Integrated Development Environment (IDE) and download it.
 - → NXP will lead to the following page.

NP		
PRODUCTS APPLICATIONS SUPPORT ABOUT	ALL - Search	۹
Sign In or Register		
Sign In Email Address Password Sprin Forgot your password? Don't have an account? Register Now	Having trouble? If you are having trouble with registration or login, we're here to help.	

3. Click Sign in.

NP		❶ ENGLISH ∽ 🖁 CART
PRODUCTS APPLICATIONS SUPPORT ABOUT	ALL - Search	۹
Sign In or Register		
Sign In Email Address Password ••••••••••••••••••••••••••••••••••••	Having trouble? If you are having trouble with registration or login, we're here to help.	

4. Download the preferred **MCUXpresso IDE** version and install the IDE.

					👤 Account	🌐 English 🔻	` ∏ Cart
				ALL -			Q
PRODUCTS	APPLICATION	IS SUPPORT	ABOUT				
NXP > Software & Support > P	roduct Information :	MCUXpresso IDE					
Software & Support	Produ	ct Informati	ion				
Product List	Floud	ct informati					
Product Search	MCUXpres	sso IDE					
Order History							
Recent Product Releases							
Recent Updates	To register a N	lew Product please click o	n the button below				
Licensing	Register						
License Lists							
Offline Activation	Current	Previous	/				
FAQ	Version I	Description					
Download Help	10.3.1	MCUXpresso IDE				Download Log	
Table of Contents							
FAQs							

4.5 Getting NXP SDK for PAN4620 Module

Getting necessary sources for software development

- 1. Visit the website <u>www.nxp.com</u>.
- 2. Search for MCUXpresso SDK Builder.
- 3. Click **Select Development Board** to search for the correct board or kit to get started. The PAN4620-ETU is based on the FRDM-KW41Z platform from NXP.

NP		
MCUXpresso SDK brings open sou applications to speed your software devi to your processor or evaluation board se	DK Builder rce drivers, middleware, and reference example slopment. Customize and download an SDK specific lections. Q. Explore and filter devices	2 SUPPORT
OVERVIEW	SOFTWARE AND TOOLS	DEVELOPER RESOURCES

4. Enter FRDM-KW41Z to the field Search by Name (1).

NXP MCUXpresso	SDK Builder	◦ > ₽ ♣ ⁸ ±
SDK Dashboard GENERAL	Select Development Board Search for your board or kit to get started.	8
Select Board		
Q Explore ADMRISTRATION NOTIFICATION Preferences DOWRLOADS D MCUXpresso IDE	Search by Name FRDM-KW41Z Select a Device, Board, or Kit Device, Board, or Kit Kits Processors	Hardware Details Board FRDM-KW41Z Device MKW41Z4 Core Type / Max Freq Cortex-MOP / 48MHz Device Memory Size 512 KB Fissh 128 KB RAM Actions
MCUXpresso Config Tools	Name your SDK SDK_22.0_FRDM+KW41Z Dont use: scale@clock@	Explore selection with Clocks tool Explore selection with Plins tool

- 5. Select the found board (2).
- 6. Enter a preferred name for the SDK (3).
- 7. Click on **Build MCUXpresso SDK** (4).

Generate a downloadable SDK archive for use with desktop MCUXpresso tools

1. Select the **Host OS** (Host Operating System) (1).

	SDK Builder		0 🗩 B 🗚 🕯
# SDK Dashboard	SDK Builder	and the second	2
GENERAL	Generate a downloadable SDK archive for use with desktop MCUXpresso Tools.		
Select Board		And the second sec	
Q Explore	Developer Environment Settings	Hardware Details	
	Selections nere will impact files and examples projects included in the SUK and Generated Projects	Board	FRDM-KW41Z
ADMINISTRATION	Host OS Toolchain / IDE	Device	MKW41Z4
Notifications	Wildows V MCOXpresso IDE V	Core Type / Max Freq	Cortex-M0P / 48MHz 512 KB Elach
Preferences		bonce memory erec	128 KB RAM
	Add middleware, operating systems, and software libraries to your SDK.	SDK Details	
DOWNLOADS	O Arid software component	SDK Version:	2.2.0 (released 2018-09-04)
MCUXpresso IDE		Host OS:	Windows
6 MCUXpresso		Toolchain:	MCUXpresso IDE
Config Tools	This MCUXpresso SDK configuration is available for direct download		SDK v2.2.x requires MCUXpresso IDE v10.0.x or later
	Archive Name	Middleware:	FatFS, 802.15.4 MAC, BLE, GenFSK, SMAC
	SDK_2220_FRDM=RVV412 (1) Don't use: S2005022220 in the name of your SDK	Documentation	
		Base SDK:	MCUXpresso SDK API Reference Manual
		Middleware:	P BLE Host Stack API Reference Manual
			IEEE 802.15.4 MACPHY API Reference Manual API Reference Manual

- 2. Select the preferred **Toolchain / IDE** (2).
- Click Add software component (3) and select optional Middleware. Available are middleware like CMSIS DSP Lib, FatFS, mbedtls, NTAG I2C, wolfssl, FreeRTOS operating system and wireless stacks like 802.15.4 MAC, Bluetooth LE, GenFSK, SMAC, Thread and Zigbee.
- 4. Click **Download SDK** (4).

4.6 Using SDK in MCUXpresso IDE

To get access to the sources in the SDK, it is necessary, to link the SDK to the IDE.

1. Open MCUXpresso IDE (v10.3.1_2233).

2. Pull the folder (zipped or unzipped) into the tab Installed SDKs in MCUXpresso IDE.



For further information about getting started with the API, the middleware and examples for wireless stacks, see the documentation folder in the SDK (SDK_2.2.0_FRDM-KW41Z > docs).

Open and Run Software Example from SDK

Import software examples

- 1. Click the field **Import SDK example(s)** in the **Quickstart Panel** of the **MCUXpresso IDE**.
- 2. Select the previously loaded SDK frdmkw41z (1).

Jun meos		Available boards					12 12 1
MCUs from insta	alled SDKs	Please select an available board for your project					
NXP MKW412	512xxx4	Supported boards for device: MKW41Z512xxxx	1				
> KW2x			1				
A KW4x	7512-004	THE REAL PROPERTY AND INCOMENTAL OF					
		unblowelliz, kwelliz	SDK nkwilz				
elected Device	:: MKW41Z512x	ox4 using board: FRDM-KW41Z	SDKs for selected MCU				
elected Device	:: MKW41Z512x cortex-m0plu:	cox4 using board: FRDM-KW41Z	SDKs for selected MCU Name	SDK Versi	Manifest	Location	
elected Device Farget Core: Description:	:: MKW41Z512x cortex-m0plus	cox4 using board: FRDM-KW41Z	SDKs for selected MCU Name BSDK, 2x, FRDM-KW41;	SDK Versi 2.2.0	Manifest 3.0.0	Location	
Selected Device Target Core: Description:	:: MKW41Z512x cortex-m0plu: KW412: Kineti Wireless Radia	oox4 using board: FRDM-KW41Z s s B KW41Z-3.4 GHz Dual Mode: BLE and 80215.4 o Microcontroller (MCU) based on ARM®	SDKs for selected MCU Name BDK_2x_FRDM-KW41: SDK_2x_US8-KW412	SDK Versi 22.0 2.2.0	Manifest 3.0.0 3.0.0	Location C\Users C\Users	

3. Click **Next >** (2).

Run the software

- 1. Select the preferred example for running a demo.
- 2. Enter a **Project name suffix** (1) to distinguish between different programs in the workspace.

	Project Options	2 Browse.
ocation CLUsers' Project Type C C Static Library C++ Static Library	Project Options	2 Browse.
Project Type ◎ C Project ◎ C++ Project ◎ C Static Library ◎ C++ Static Library	Project Options	
O C Project ○ C++ Project ○ C Static Library ○ C++ Static Library		
	SDK Debug Console Semihost UART Copy sources Import other files	
xamples	2	a 🖉 🗹 🙀 🎛 🖲
ype to filter	Varia	
Image: Second		:

3. Click **Browse** (2) to select the location for the project (usually, the predefined workspace).

We will select the **wireless_examples** > **thread** > **router_eligable_device** > **freertos** (3) example to show a Thread network demonstration.

4. Click **Next >** (4).

Advanced Settings

5. Click **Finish** (1).

C/C++ Library Settings							
et library type (and host	ing variant) Redlib (sen	nihost-nf)	-				
Redlib: Use floating po	int version of printf		New!	NewlibNano: Use floating point version of printf			
Redlib: Use character r	ather than string based p	printf	Newl	ibNano: Use floating poir	nt version of scanf		
Redirect SDK "PRINTF"	to C library "printf"		C Redir	ect printf/scanf to ITM			
Include semihost Hard	Fault handler		Redir	ect printf/scanf to UART			
MCU C Compiler							
_							
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anguage standard GNU MCU Linker	C99 (-std=gnu99)					•	
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Inguage standard [GNU MCU Linker Link application to RAI Memory Configuration Memory details Default LinkServer Flash I Type Flash RAM Add Flash Add RAM	C99 (-std=gnu99) M Driver Name PROGRAM_FLASH SRAM	Allas Flash RAM Split Join Delete	Location 0x0 0x1ff78000	Size 0x80000 0x20000 ipport Merge Export	Driver FTFA_2K.cfx tun Generate_	Browse	
Inquage standard (GNU MCU Linker Link application to RAA Memory Configuration emory details Default LinkServer Flash I Type Flash RAA Add Flash Add RAAM Micro Trace Buffer	CS9 (-std=gnu59) 4 Driver Name PROGRAM_FLASH SRAM	Alias Flash RAM Spiti Join Delete	Location Dx0 Dx1ff8000	Size 0x80000 0x20000 uport [Merge] Export	Driver FTFA_2K.cfx	Browse	

Compile the example project

1. Click onto the project inside the Project Explorer (1) within MCUXpresso IDE.



- 2. Click the Build icon ⁽²⁾ in **Quickstart Panel** (3) or Toolbar, to compile the example project.
 - • (2) # 1 % (9) • 31 • 5 6 • 6 • 18 12 • 💷 🕲 | 🕲 • • toj... 33 🕆 Peri.
 a memore-edu-gdb 81.0.201015

 Welcome @ Hijzerthime @ Hijzerthime @ Hojzerthime.

 107 /GS.T.K.B.FEIE(tstruck task, gbsinThreadPriority_c, 1, gbsinThreadStackSize_c, 0);

 1080 // Finitizerthime.

 1080 // F 1640-71 Verter Allocates a coObjectStruct_t block in the coObjectNeep array. 1890 * Varemaining pointer to the object info <u>struct</u>. 1811 * Object can be semaphere, parket, message Oceae, event 1897 * (verturn Pointer to the allocated coObjectStruct_t, MUL if failed. 1894 * Varemainter Structure (Structure). raction free stors 1054 * \pre 1055 * 1056 * \post 1057 * MCUXpresso IDE - Quickstart Panel Create or import a project 🕲 Installed SDRs 🗇 Properties 🛱 Console 🕫 🖺 Problems 🚯 Memory 🛞 Debugger Console 🐵 Instruction Trace 🚥 Power Measurement Tool 📓 SWO Trace Config 7 In the second s Second seco SEGGER J-Link GDB Server V6.42b - Terminal output channel Che Che Debug Writable Smart Insert 1041:1
 - → MCUXpresso IDE after starting the debug process.

Flash the software

- 1. Connect the PAN4620 evaluation board to the PC.
- 2. Click the Debug icon $\frac{4}{7}$ (1).

workspace - frdmkw41z_wireless_examples_thread_router	_eligible_device_freetox/framework/OSAbstraction/Source/fsl_os_abstraction_free_ttos.c - MCUXpresso IDE	
File Edit Source Refactor Navigate Search Project	ConfigTools Run Window Help	
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P Co Flash	 Inread #1 5/005 (suspended: breakpoint) 	
i Gradiad Ib	= main() at 15_05 abstraction_mee_ntos.cl.D41 0x42914	
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n 🕞 GHO		10.0
Es Keyboard	Welcome (a tsi_xcvr_trim.c al tsi_os_abstraction_tree_ntos.c % (a) port.c (a router_eligible_device_app.c (a queue.c	
v 😁 LED	1037 OSA_TASK_DEFINE(startup_task, gMainThreadPriority_c, 1, gMainThreadStackSize_c, 0) ;	
o 💩 Lists	1038 int main (void)	
b CowPower	1039 (104) // Taitialing W() alash #/	
b Ger MemManager	1000 / Initiatize not clock /	
Messaging	1942 OSA Task(restr(OSA TASK(startun task), NULL):	
🕫 👺 ModuleInfo	1043 vTaskStartScheduler():	
MWSCoexistence	1044	
P 😁 NVM	1845 return 0;	
 OSAbstraction 	1946 }	
Interface	1847	
+ 2b Source	1043= /*	
Isl_os_abstraction_free_rtos.c	1949 * (brief Allocates a osubjectstruct t block in the osubjectheap array.	
- Reals	1050 - Quarantini pointer to the object into Sirvay.	
	1052 * Vreturn Pointer to the allocated ostbietStruct t NUL if failed	
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New project_		1. ET 10 40 40 - PT -
Import SDK example(s)	frdmkw41z wireless examples thread router eligible device freetos ILink Debug (GD8 SEGGER Interface Debugging) frdmkw41z wireless examples thread router eligible device freeto	saxf
Import project(s) from file system	INCUXpresso Semihosting Telnet console for 'frdmkwilz wireless examples thread router eligible device freertos JLink Debug' started on po	rt 54915 @ 127.0.0.11
* Build your project		
and Jon Project	SEGGER J-Link GDB Server V6.42b - Terminal output channel	
Build		
Clean		
- Debug your project		
- octoby your project		
👥 🎋 Debug 🛛 🚺		
Terminate, Build and Debug	* *	
O NXP MKW417512004 (Indexinad1a freetos)	Writable Smart Insert 1041:1	

- → The software will be flashed with the onboard J-Link-OB-SAM3U128 to the PAN4620 module. Wait till this process is finished.
- 3. Click the Start icon ▶ (2) in the toolbar, to run the application on the PAN4620 evaluation board.

Cor	nect to target: MKW41Z5	12xxx4			
2 1	robes found. Select the probe t	o use:			
Av	ailable attached probe	S			
	Name	Serial number/ID	Туре	Manufa	IDE Debug Mode
	J-Link-OB-SAM3U128	483062632	USB	SEGGER	All-Stop
R	J-Link-OB-SAM3U128	483062634	USB	SEGGER	All-Stop
Sup	ported Probes (tick/untick to en MCLIXpresso IDE LinkServer (in	nable/disable)			
	P&E Micro probes	c. civisis-bAr) probe	- 5		
	SEGGER J-Link probes				
Pro	be search options				
V V Prc	MCUXpresso IDE LinkServer (in P&E Micro probes SEGGER J-Link probes be search options	c. CMSIS-DAP) probe	25		

4.7 Using Test Tool 12

Another way to flash a previously written program to the PAN4620 device is the **Test Tool 12** provided by NXP.

The following requirements must be met:

- ✓ NXP account
 - 1. Go to NXP website (www.nxp.com).
 - 2. Search for Test Tool for Connectivity Products.
 - 3. Accept the Agreement for the Test Tool.
 - 4. Sign in on NXP website.
 - 5. Download and install the Test Tool on the PC.

Starting the Test Tool 12

- 1. Connect the PAN4620 ETU device to the PC.
 - → After windows driver installation the device with COM port will show up in window Command Console (1).

•
penSDA or JLink.

2. Click on the tab Firmware Loader (2).



3. Select the preferred J-Link device in the list (1).

The label on the bottom of the PAN4620 ETU device will give the Segger J-Link ID of the board, which can be found in the mentioned list.



- 4. Click **browse** (2).
- 5. Navigate to the file, which should be flashed on the PAN4620 ETU device. The file must be in *.srec or in *.bin format.

ন্ট্র Select an *.srec or a *.bin file	
G v 🖡 « 3_Demos 🕨 #2 - PAN4620 - Thread - RouterEligableDevice 🔹 4 🐙 #2	- PAN4620 - Thread 🔎
Organisieren - Neuer Ordner	🛚 🔹 🗌 📀
A Name	Änderungsdatum
frdmkw41z_wireless_examples_thread_router_eligible_device_freertos.bin	06.02.2019 11:56
A Control Control of C	
🖕 Anna (1. anna) 🗮	
· manager comme	
In the other	
6.00x	
a tarrente	
1 m	
· · ·	4
Dateiname: frdmkw41z_wireless_examples_thread_router_eligible_device_fre V	d or Bin files (*.srec;: •
Öffner	n 🔻 Abbrechen

There are two options: The first option is to generate the mentioned files in an Integrated Development Environment (IDE) like IAR Embedded Workbench or MCUXpresso from NXP. The second option is to use some of the already generated files that are available in the NXP SDK (see folder path: SDK_2.2.0_FRDM-KW41Z_16_01_2019 > tools > wireless > binaries).



1. Click Upload (1).



- 2. Select the controller **KW41Z** (2), which is used on PAN4620 device.
- 3. Click **OK** (3).
 - → The Test Tool 12 will flash the program to the PAN4620.
 - → Now the previously written application can be evaluated and used.

Next to the Firmware Loader option, the NXP Test Tool 12 comes with additional functions like a Protocol Analyzer, a Radio Test or an OTA (Over The Air) Update section. For more information about the Test Tool see "Freescale Test Tool User's Guide".

4.8 Using Thread Example Application

Flash at least two of the PAN4620 evaluation boards with the software

(frdmkw41z_wireless_examples_thread_router_eligible_device_freertos)
mentioned in the MCUXpresso section.

- 1. Open two terminal programs like **HTerm** and connect to the COM ports of both nodes. Use the serial configurations for the nodes (like the figures below will show).
- 2. On the first node enter the command thr create and press Enter.



Take care that there is always the **CR-LF** option selected at the menu **send on enter** in the section **Input control** of **HTerm** or similar terminal programs.

→ Wait till the node has created the Thread network (here with the ID 0xc26d).



- 3. On the second node enter the command thr join and press Enter
 - ➔ The node will search for existing Thread networks (RGB LED5 will change colors fast) and connect to the previously created network automatically.

🚰 HTerm 0.8.1beta	
File Options View Help	
Disconnect Port COM111 R Baud 115200 Data 8 Stop 1 Parity None	CTS Flow control
Rx 882 Reset Tx 24 Reset Count 0 🔹 0 Reset Newline at LF	 Show r charact
Clear received Ascii Hex Dec Bin Save output • Clear at 0 - Newline every 0 - V	Autoscroll 📃 Show er
Received Data	
1 5 10 15 20 25 30 35 40 45 50 55 60 65 70	75 80 ^
<pre>UNET starting</pre>	L'm.
w\$ thr joinw	
wwJoining networkw	
w\$ wCommissioning successfulw	=
w\$ wAttached to network with PAN ID: 0xc26d w	
Ww	
\s\$ \sTemp:32.00\s \s\$	
Selection (-)	
Input control Input cotions	×
Clear transmitted Ascii Hex Dec Bin Send on enter CR-LF Send file DTR RTS	
Type ASC	ASend
Transmitted data	x
1 5 10 15 20 25 30 35 40 45 50 55 60 65 70 factoryresetym	75 80 -
thr joinww	=
	-
History -/2/10 Connect to COM111 (b:115200 d:8 s:	p:None)

- 4. Press **SW2** on both PAN4620-ETU nodes, to change the color of the RGB LEDs on both nodes.
 - → Thread network is working.
- 5. Press the button SW3.
 - ➔ Everything within the software is prepared and implemented to exchange the measured temperature between the nodes.



Get more information about the possibilities and commands, in Thread networks, with the commands help and help thr.

(j)

Please note that there is no thermistor mounted on the PAN4620-ETU. Just the software is prepared for this use case. To measure a correct temperature, it is recommended, to use the "thermistor measuring circuit" shown in "FRDM-KW41Z Freedom Development Board User's Guide" (chapter "Thermistor").

The chosen Thread software example gives additionally the possibility, to use touch sensitive inputs on the Pins "PTC16 (TSI0_CH4)" and "PTC17 (TSI0_CH5)". If PAN4620 evaluation board is delivered with already mounted pin headers for "JP2" and "JP5", notice that these inputs can detect the human body by contact and affect the software.

5 Restricted Use

5.1 Life Support Policy

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6 Appendix

6.1 Ordering Information

Variants and Versions

Order Number	Brand Name	Description	MOQ
ENWC9B01AQEF	PAN4620-ETU	USB Evaluation Board	1
ENWC9B01A1EF	PAN4620	PAN4620 Module	1 500

6.2 Contact Details

6.2.1 Contact Us

Please contact your local Panasonic Sales office for details on additional product options and services:

For Panasonic Sales assistance in the **EU**, visit <u>https://eu.industrial.panasonic.com/about-us/contact-us</u> Email: <u>wireless@eu.panasonic.com</u>

For Panasonic Sales assistance in **North America**, visit the Panasonic website "Sales & Support" to find assistance near you at <u>https://na.industrial.panasonic.com/distributors</u>

Please visit the **Panasonic Wireless Technical Forum** to submit a question at https://forum.na.industrial.panasonic.com

6.2.2 Product Information

Please refer to the Panasonic Wireless Connectivity website for further information on our products and related documents:

For complete Panasonic product details in the **EU**, visit <u>http://pideu.panasonic.de/products/wireless-modules.html</u>

For complete Panasonic product details in **North America**, visit <u>http://www.panasonic.com/rfmodules</u>