

# Quick Start Guide

**MED-SPI**  
Spirometry  
Plug-in Board



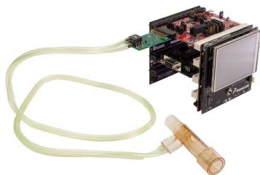
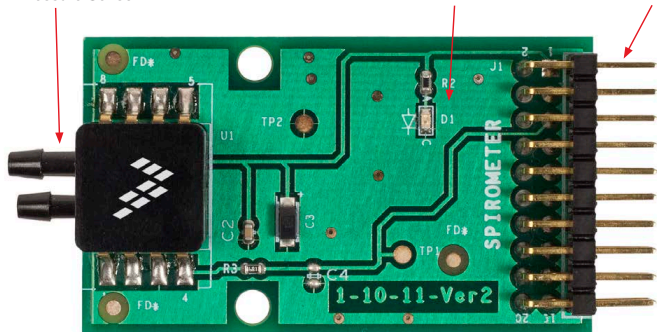
**TOWER SYSTEM**

# Get to know the MED-SPI Board

MPXV7025DP Differential Pressure Sensor

Power on LED

Medical Connector



## MED-SPI Freescale Tower System

The MED-SPI plug-in board is compatible with the Freescale Tower System, a modular development platform that enables rapid prototyping and tool re-use through reconfigurable hardware. Elevate your design to the next level with this industrial powerhouse by building your Tower System today.



## MED-SPI Features

MED-SPI is a development board which demonstrates the basic implementation of a spirometry application. It includes the MPXV7025DP differential pressure sensor, which allows calibrated pressure and air flow measurements ideal for medical respiratory monitoring devices.

### **Features**

- Tower System compatible
- Integrated Freescale MPXV7025DP
- Reduced components
- Easy to implement

## Step-by-Step Installation Instructions

In this quick start guide, you will learn how to set up the MED-SPI and Tower System and run the included demonstrated software. For more detailed information, review the user manual at [freescale.com/healthcare](http://freescale.com/healthcare).

### 1 Verify the Jumper Configuration

Verify the jumper configuration on each board according to the Jumper Configurations table found later in this guide.

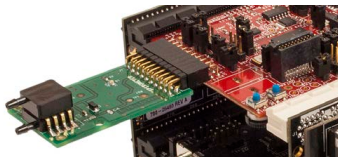
### 2 Assemble the Tower System

Assemble the Tower System by matching primary and secondary sides on the serial and MCU boards to corresponding elevators.



### 3 Connect the MED-SPI AFE

Connect the MED-SPI AFE to the medical connector on TWR-K53N512. Board must be placed as shown below.



**Note:** MED-SPI board must be plugged to the medical connector before the Tower System gets powered

### 4 Download and Install Software

Download and install IAR Embedded Workbench 6 for ARM®. A 30-day trial version can be downloaded from [iar.com](http://iar.com).

## 5 Install the Drivers

Install P&E Micro drivers. The installer is located in IAR installation folder\arm\drivers\pemicro.

Name	Date modified	Type	Size
DRIVERS11_install_120720	8/21/2012 1:52 PM	Application	4,203 KB
PEMicro_CrossPack_v100	8/21/2012 1:47:58.4	Win7/Win Etc...	659 KB

## 6 Connect a USB Cable

Connect a USB cable from the computer to the USB port on the TWR-K53N512 board. Wait for drivers to install.



## 7 Download the Application Note

Go to **freescale.com** and conduct a parametric search for AN4325. Download AN4325SW.zip.

## 8 Open the File

Open the file MED-SPI\_K53.eww using IAR from \Software\MED-SPI\_K53\app\cdc\iar\_ew\kinetis.

## 9 Load the Firmware

Click the Debug button to load the firmware to the MCU.



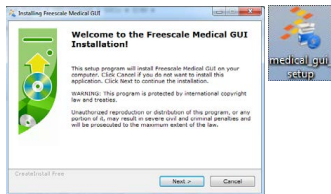
# Step-by-Step Installation Instructions

Continued

## 10 Install the Software

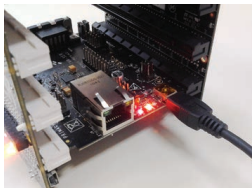
Install the Medical GUI software. It can be downloaded from [freescale.com](http://freescale.com).

**Note:** Make sure you have already installed Java® JDK on your computer. Look for JDK folder in: C:\Program Files\Java



## 11 Change the Connection

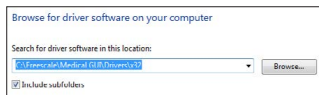
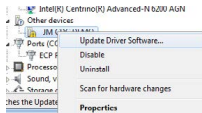
Disconnect the USB cable from the TWR-K53N512 and connect it to the TWR-SER board.



## 12 Install Drivers for JM CDC Demo

If the driver is not installed automatically, open Device Manager and install drivers for JM CDC Demo. Drivers can be found here:

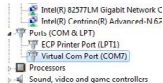
- 32-bit version:  
C:\Freescale\Medical GUI\Drivers\x32
- 64-bit version:  
C:\Freescale\Medical GUI\Drivers\x64



**Note:** Open the Device Manager by opening the start menu, right-clicking on Computer and selecting Manage. Device manager is on the left options tree.

## 13 Look for the COM Number

In the device manager, look for the COM number assigned to “Virtual Com Port.”



## 14 Open the Medical GUI

Open the Medical GUI and select the Virtual Com Port from previous step.

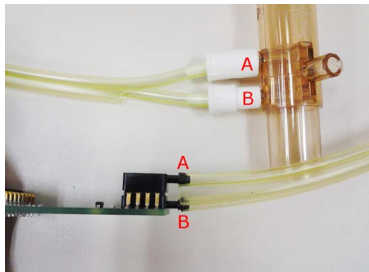


# Step-by-Step Installation Instructions

*Continued*

## 15 Attach the Hose

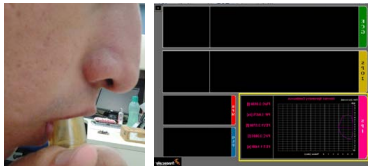
Attach the hose to both the mouthpiece and the pressure sensor as shown in the image below.



## 16 Breathe into the Tube

In the main window, click the SPI section (pink) and follow the next steps:

1. Place the tube in your mouth
2. Inhale as much air as you can.
3. Without taking the tube out of your mouth exhale as hard and fast as possible.
4. Click again on the SPI section.





## MIU-5PI Jumper Options

The following is a list of jumper options. The default installed jumper settings are shown in white text within the green boxes.

### TWR-K53N512 Jumper Configurations

Jumper	Position	Function
J1	Open	R71 to ADC1_DM1
J3	Open	FlexBus Latch OE
J4	2-3	Medical Connector Pin 4 Function
J11	<b>1-2</b>	External Oscillator Selection
J15	<b>Connected</b>	Core VDD
J17	<b>Connected</b>	Oscillator Power Enable
J18	<b>Connected</b>	USB0_VBUS Voltage In
J24	<b>1-2</b>	SYS_PWR Select
J28	<b>Open</b>	Disable JM60 Bootloader
J34	<b>Open</b>	Oscillator OE Control

## TWR-SER Jumper Configurations

Jumper	Position	Function
J10	1-2	VBDEV Source
J16	3-4	USB Mode Select
J2	1-2	CLK_SEL Source





Visit [freescale.com/healthcareAFE](http://freescale.com/healthcareAFE) for the latest information, including:

- AN4325 application note

## Support

Visit [freescale.com/support](http://freescale.com/support) for a list of phone numbers within your region.

## Warranty

Visit [freescale.com/warranty](http://freescale.com/warranty) for complete warranty information.

For more information, visit [freescale.com/Tower](http://freescale.com/Tower)

Join the online Tower community at [towergeeks.org](http://towergeeks.org)

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