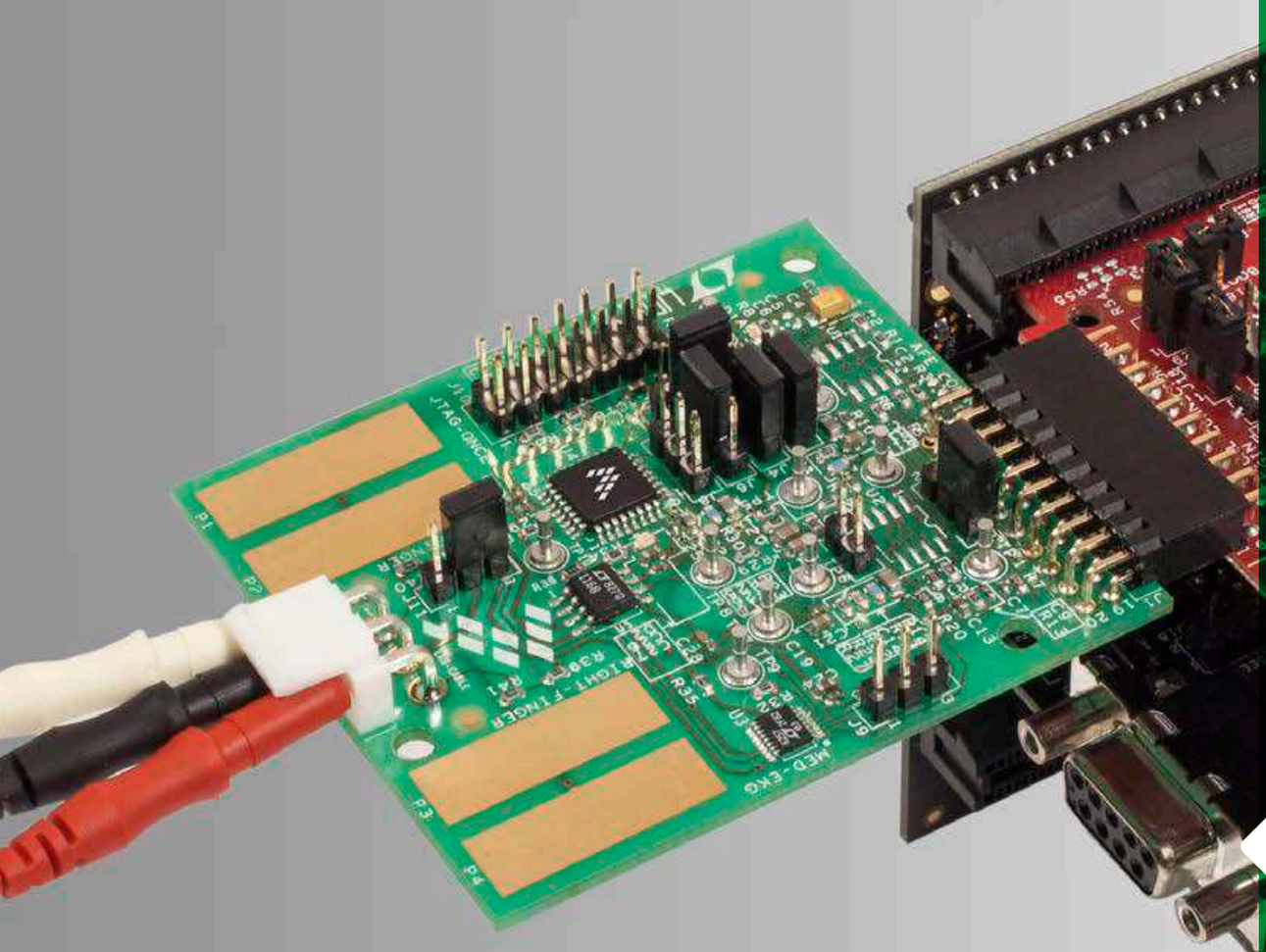


Quick Start Guide

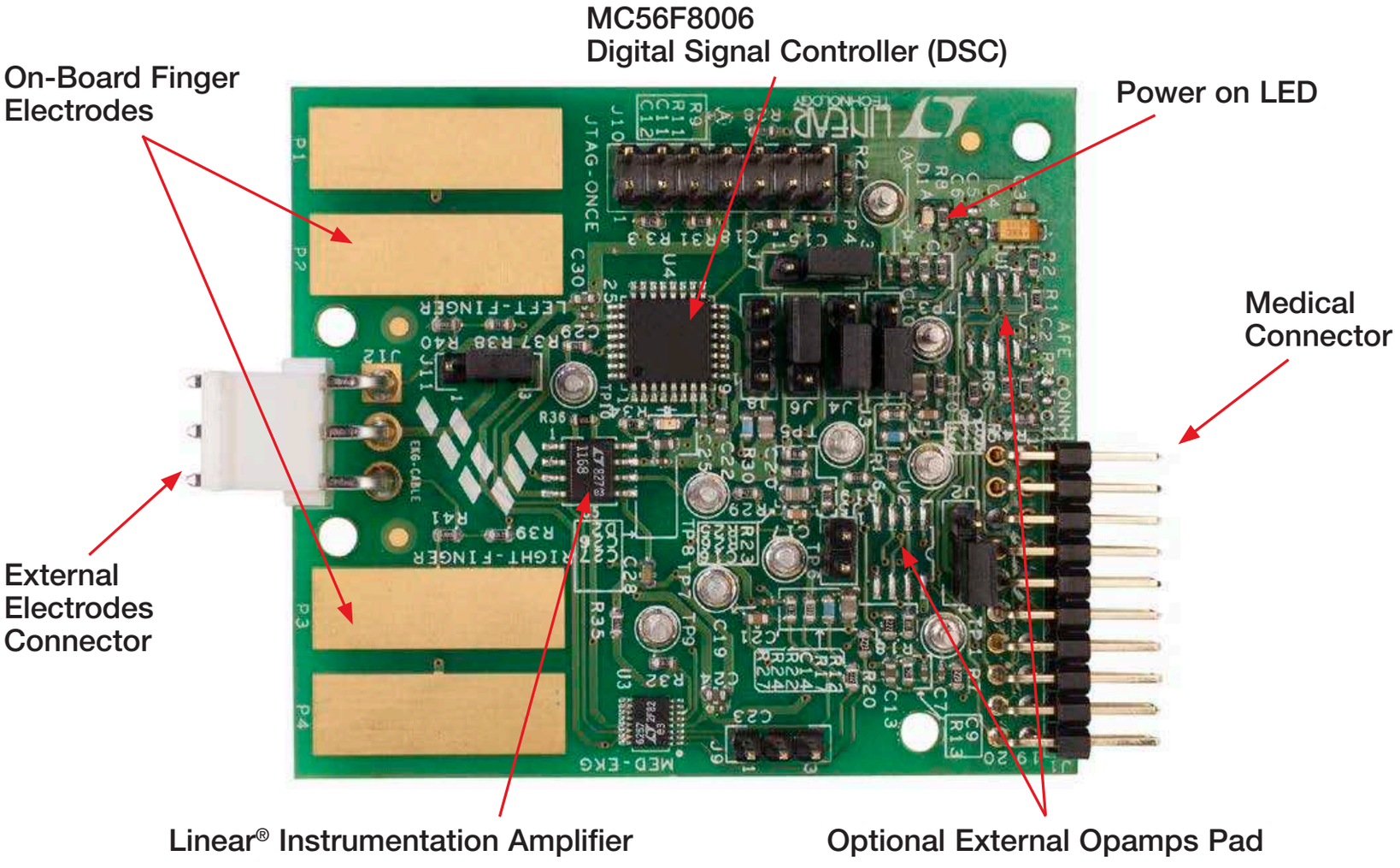
MED-EKG

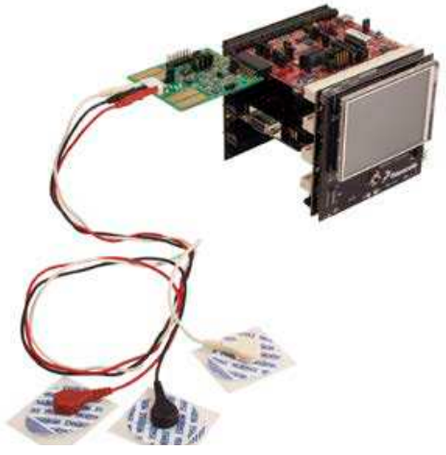
Electrocardiograph
Plug-in Board

freescale™

TOWER SYSTEM

Get to Know the MED-EKG Board





MED-EKG
Freescale Tower System

The MED-EKG 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-EKG Features

MED-EKG is an auxiliary board used for developing solutions oriented to electrocardiography and heart rate monitoring. This board allows designers to accelerate the development of medical devices based on electrocardiography, providing a scalable solution that can be adjusted to the final product needs.

Features

- Tower System compatible
- Integrates all required components for electrocardiograph development
- Four finger electrodes
- External electrodes connector for increased accuracy
- MC56F8006 DSC included on the board

Step-by-Step Installation Instructions

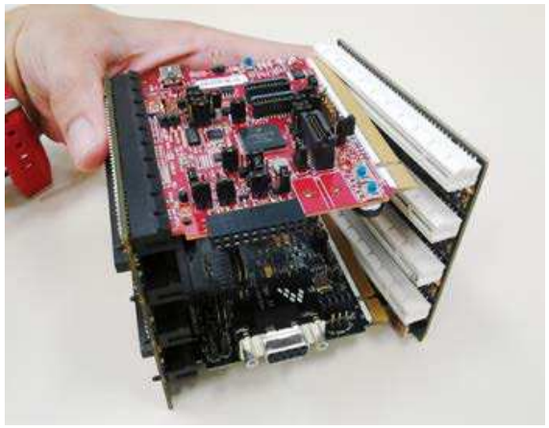
In this quick start guide, you will learn how to set up the MED-EKG and Tower System and run the included demonstrated software. For more detailed infomation, review the user manual at **freescale.com/healthcare**.

1 Verify the Jumper Configuration

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

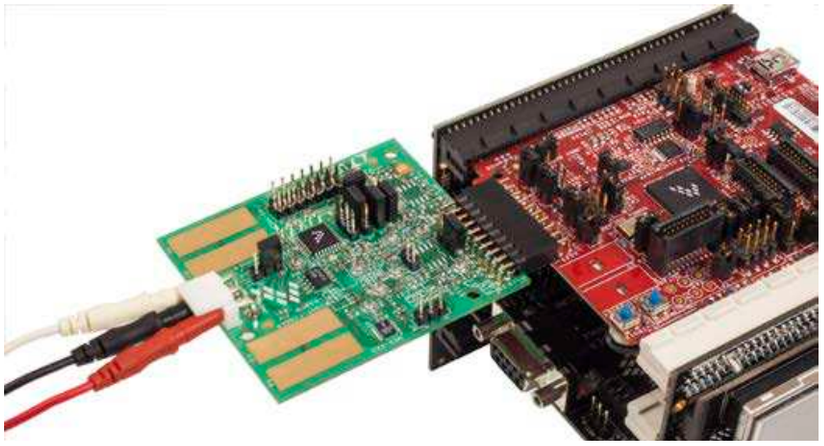
2 Assemble the Tower System

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



3 Connect the MED-EKG AFE

Connect the MED-EKG AFE to the medical connector with embedded electrodes facing upwards.

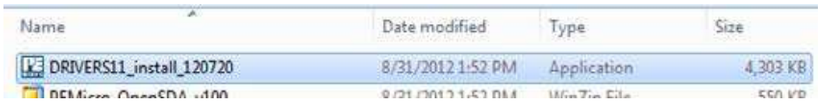


4 Download and Install Software

Download and install IAR Embedded Workbench 6 for ARM. A 30-day trial version can be downloaded from **iar.com**.

5 Install the Drivers

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



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

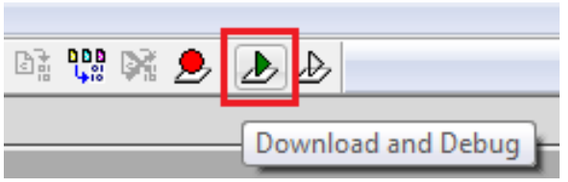
Go to **freescale.com** and conduct a parametric search for AN4323. Download AN4323SW.zip.

8 Open the File

Open the file MED-EKG K53.eww using IAR from \Software\MED-EKG 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

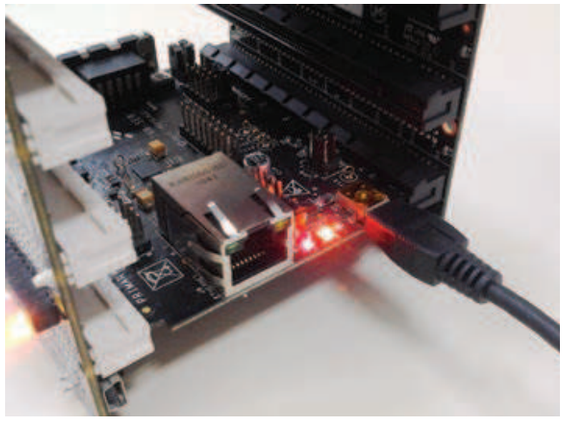
10 Install the Software

Install the Medical GUI software. It can be downloaded from **freescale.com**.

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

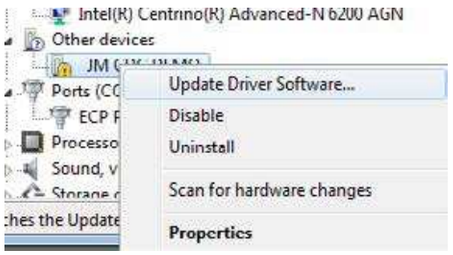
Disconnect the USB cable from the TWR-K53N512 and connect it to the TWR-SER board.

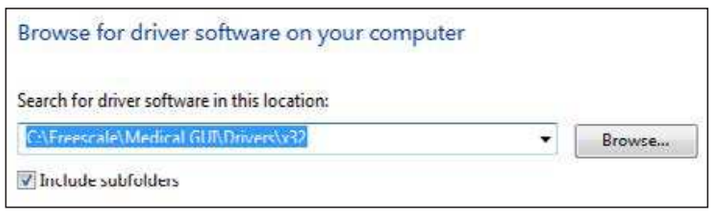


12 Install Drivers for JM CDC Demo

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





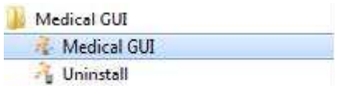
Note: Open the Device Manager by opening the start menu, right clicking on Computer and selecting Manage. Device manager is on the left options tree.

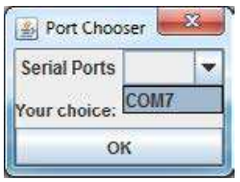
13 Look for the COM Number

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

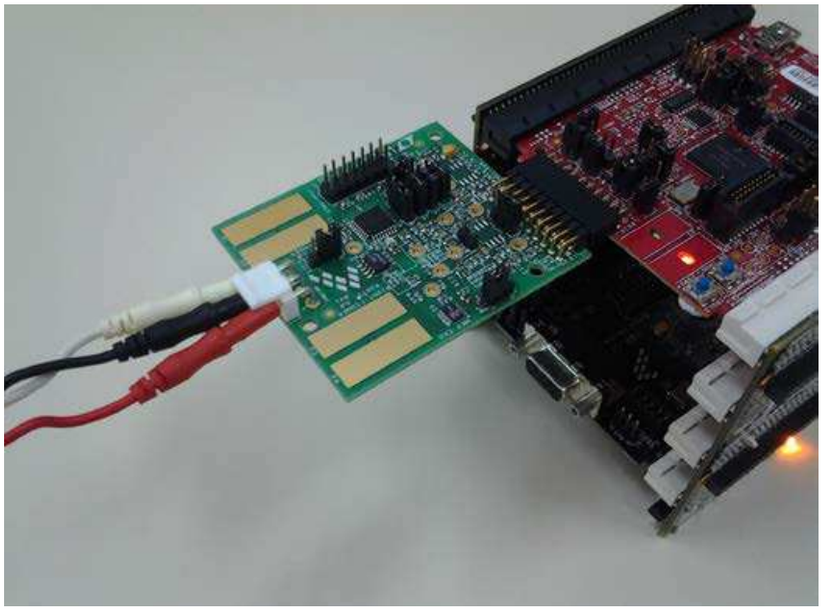
15 Attach the Leads

Attach each EKG lead to an EKG patch electrode.

16 Connect the EKG Wires

Connect EKG wires to J12 on MED-EKG board.

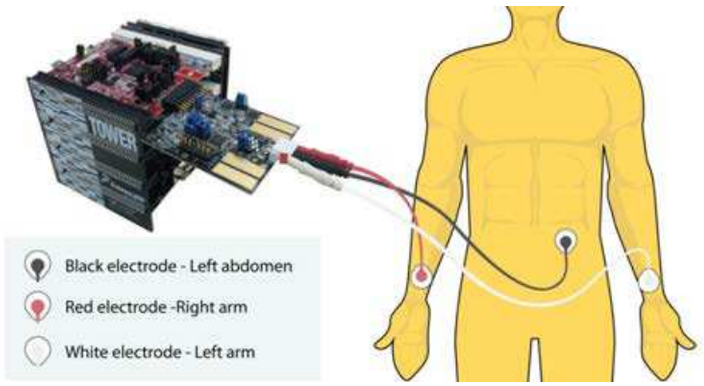
- Pin 1: White lead
- Pin 2: Black lead
- Pin 3: Red lead



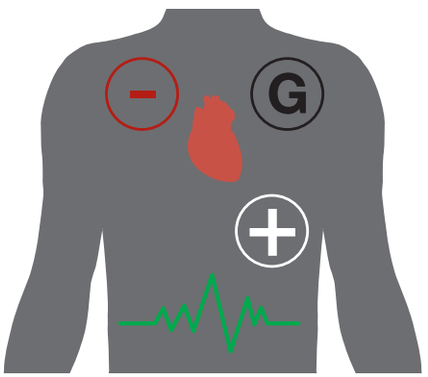
17 Connect the Electrodes

Connect the patch electrodes to your body as follows:

- Black electrode: Left abdomen
- Red electrode: Right arm
- White electrode: Left arm

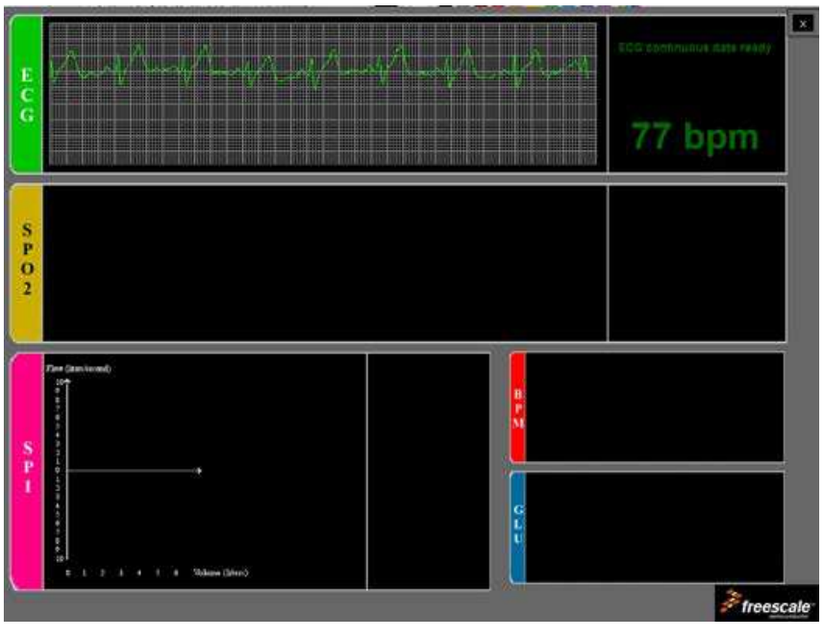


To obtain the DII lead that physicians most commonly use, please follow the following electrode placement:



18 Start Measurements

In the main window, click the ECG section (green) to start/stop measurements.



MED-EKG 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	**1-2**	External Oscillator Selection
J15	**Connected**	Core VDD
J17	**Connected**	Oscillator Power Enable
J18	**Connected**	USB0_VBUS Voltage In
J24	**1-2**	SYS_PWR Select
J28	**Open**	Disable JM60 Bootloader
J34	**Open**	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

MED-EKG Jumper Configurations

Jumper	Position	Function
J2	**1-2**	Opamp 2 VREF Selector
J3	1-2	Intsrumentation Amplifier Gain Selector 1
J4	1-2	Instrumentation Amplifier Gain Selector 2
J6	**2-3**	Right Electrode Output Selector
J7	**2-3**	Left Electrode Output Selector
J11	2-3	Reference Electrode Voltage Selector

Visit **freescale.com/healthcareAFE** for the latest information, including:

- AN4323 application note

Support

Visit **freescale.com/support** for a list of phone numbers within your region.

Warranty

Visit **freescale.com/warranty** for complete warranty information.

For more information, visit freescale.com/Tower

Join the online Tower community at towergeeks.org

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