# Keysight Technologies
# M9380A PXIe CW Source
## 1 MHz to 3 GHz or 6 GHz

## Configuration Guide

**KEYSIGHT**
**TECHNOLOGIES**

# Overview

This configuration guide provides instructions to help you configure the M9380A PXIe CW Source and expand the system to meet your requirements. Product upgrades, related products and physical connection schematics are also featured.

For more detailed product and specification information refer to the following literature and web pages:

– M9380A data sheet (literature no. 5991-0283EN)

– M9018A PXIe 18 slot Chassis data sheet (literature no. 5990-6583EN)

– M9036A PXIe Embedded Controller data sheet (literature no. 5990-8465EN)

– M9037A PXIe High Performance Embedded Controller data sheet (literature no. 5991-3661EN)

– M9300A data sheet (literature no. 5991-0898EN)

– M9381A data sheet (literature no. 5991-0279EN)



Figure 1. Keysight Technologies, Inc. M9380A PXIe CW Source (includes M9310A and M9301A), pictured with the M9300A frequency reference and M9036A embedded controller in M9018A 18-slot chassis with Y1212A slot blockers and Y1213A filler panels.

# A. Select Options for M9380A PXIe CW Source

**Step 1. Start with M9380A base configuration**

◉          The M9380A PXIe CW Source (occupies 2 slots) includes:

| | | |
|---|---|---|
| M9301A | PXIe synthesizer | – Frequency range 1 MHz - 3 GHz |
| M9310A | PXIe source output | – One day startup assistance |
| | | – Modular interconnect cables |
| | | – Software, example programs and product information on CD |
| | | – Return to Keysight warranty – 3 years |

**Step 2. Choose a frequency range**

| | | | |
|---|---|---|---|
| ◉ | M9380A-F03 | Frequency range 1 MHz – 3 GHz | Included in base configuration |
| ○ | M9380A-F06 | Frequency range 1 MHz – 6 GHz | |

**Step 3. Add high output power (optional)**
Minimizes need for external amplification to overcome power loss

| | | | |
|---|---|---|---|
| ○ | M9380A-1EA | High output power | Max output power +18 dBm across the frequency range. |

# B. Add a M9300A PXIe Frequency Reference

**Step 1. Add a PXIe frequency reference (occupies 1 slot)**
Required to meet datasheet specifications. It has five 100 MHz outputs which can support up to five CW sources.

| | | | |
|---|---|---|---|
| ○ | M9380A-300 | Adds M9300A PXIe Frequency Reference | Five 100 MHz outputs<br>One 10 MHz output<br>Internal 10 MHz OCXO timebase output |

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# C. Select Controller (either Embedded Controller or via PC)[1]

○ M9036A Mid-Performance Embedded Controller
Intel i5-520E dual-core, 2.4 GHz, 4 thread, 4GB RAM

Select the M9036A for mid-performance, lower cost
or, if your application requires XP operating system

○ M9037A High-Performance Embedded Controller
Intel i7-4700EQ quad-core processor, 2.4 GHz, 8 thread,
4GB RAM

Select M9037A for the best performance if you have
memory intensive applications, multiple applications
running in parallel or if a lot of data is sent to the PC
from the PXIe chassis. Features removable SSD drive
for security and x8 connector from front for connection
to second chassis

**Step 2. Upgrade from standard memory size (optional)**

For M9036A

| | | |
|---|---|---|
| ○ | M9036A-M08 | Memory upgrade from 4 GB to 8 GB RAM |

For M9037A

| | | |
|---|---|---|
| ○ | M9037A-M08 | Memory upgrade from 4 GB to 8 GB RAM |
| ○ | M9037A-M16 | Memory upgrade from 4 GB to 16 GB RAM |

**Step 3. Select an operating system**

For M9036A

| | | |
|---|---|---|
| ○ | M9036A-WE3 | Microsoft Windows Embedded Standard 7 (32-bit) |
| ○ | M9036A-WE6 | Microsoft Windows Embedded Standard 7 (32-bit) |
| ○ | M9036A-WXP | Downgrade to Microsoft Windows XP (32-bit) |

For M9037A

| | | |
|---|---|---|
| ○ | M9037A-WE3 | Microsoft Windows Embedded Standard 7 (32-bit) |
| ○ | M9037A-WE6 | Microsoft Windows Embedded Standard 7 (32-bit) |

1. For list of qualified external controllers, please see Test Computer List Technical Note literature no. 5990-7632EN. The M9021A is used for both PC controllers and can only be used in the M9018A chassis.
2. The M9018A 18-slot chassis includes empty space to the left of the 1st functional slot. The embedded controller occupies that empty space and the 1st functional slot.

## To use your laptop PC as a controller

| | | |
|---|---|---|
| ○ | M9045B | PCIe ExpressCard Adaptor |
| ○ | Y1200B | PCIe Cable |
| ○ | M9021A | PCIe Cable Interface[3]: 1 slot |

## To use your desktop PC as a controller

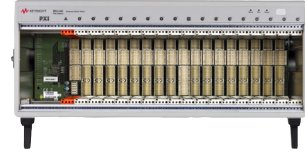| | | |
|---|---|---|
| ○ | M9048A | PCIe Desktop Adaptor |
| ○ | Y1202A | PCIe Cable |
| ○ | M9021A | PCIe Cable Interface[3]: 1 slot |

3. The M9021A is used for either PC control option and can only be used with the Keysight M9018A 18-slot chassis.

# D. Select a Chassis and Accessories

## Step 1. Select a Chassis

○      M9018A      18-slot PXIe chassis

## Step 2. Choose enough slot blocker kits and EMC filler panels to fill every open slot
Recommended to achieve datasheet specifications

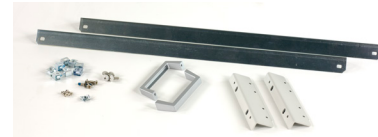○      Y1212A      Slot blocker kit: 5 slots

○      Y1213A      PXI EMC filler panel kit: 5 Slots

## Step 3. Choose a rack mount kit (optional)

○      Y1215A      Rack mount kit for M9018A 18-slot PXIe chassis

## Step 4  Choose an air inlet kit1 (optional)
Recommended for rack mounted systems with less than 1U space below chassis.

○      Y1214A      Air Inlet kit: M9018A 18-slot chassis[1]

1. Available in 1-slot, 2-slot or 3-slot options depending on the chassis configuration. For more information, please visit www.keysight.com/find/m9018a

# Physical Connections
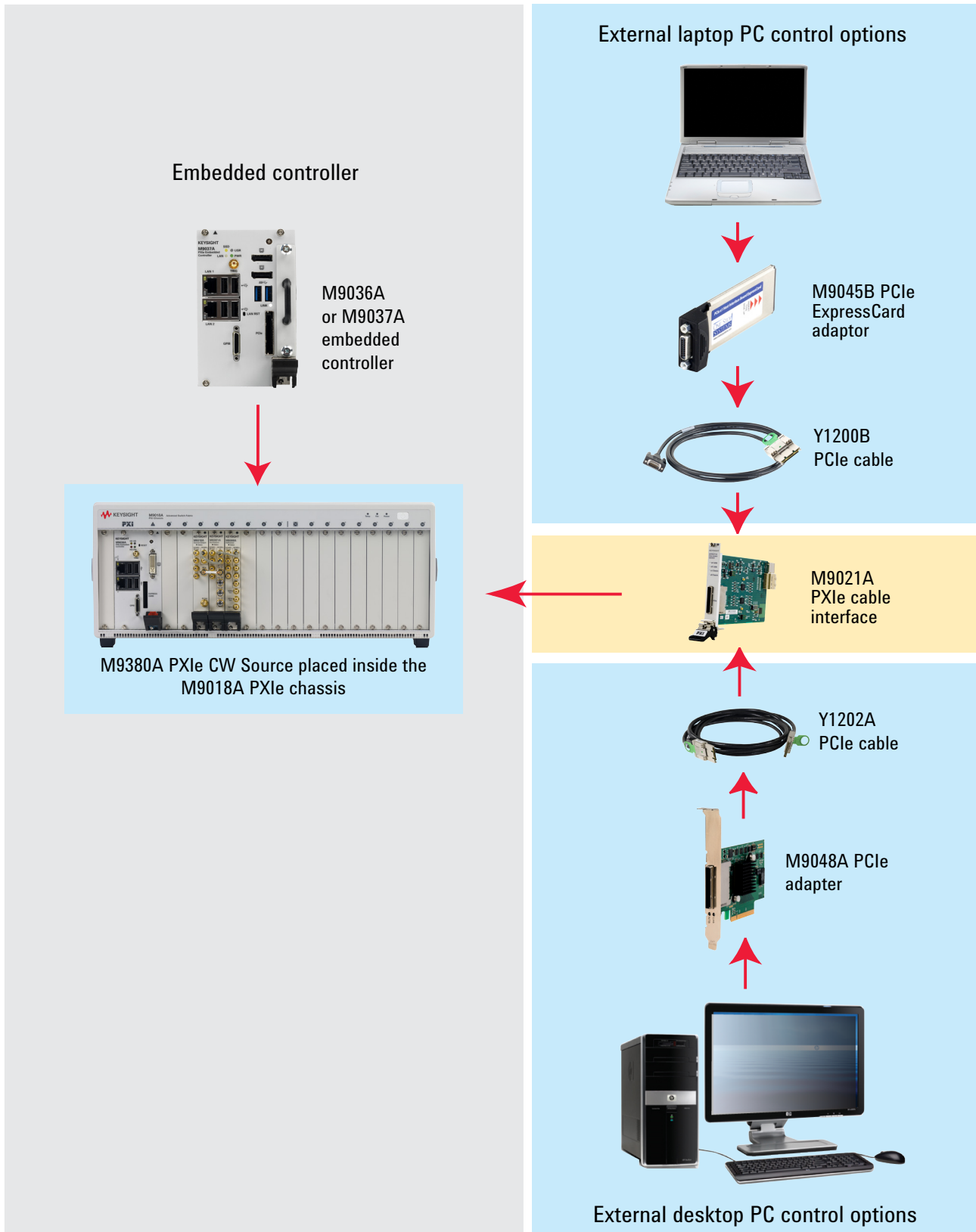
## Physical connection diagram for controllers



External laptop PC control options

Embedded controller

M9036A or M9037A embedded controller

M9045B PCIe ExpressCard adaptor

Y1200B PCIe cable

M9021A PXIe cable interface

M9380A PXIe CW Source placed inside the M9018A PXIe chassis

Y1202A PCIe cable

M9048A PCIe adapter

External desktop PC control options

Figure 2. Embedded controller and external PC controller connections.

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# E. Select Software

**Step 1. Start with M9380A base configuration**

◉ The M9380A comes standard with the following software:
  – Keysight IO Libraries Suite including Connection Expert [1]
  – Instrument software, soft front panel, drivers for use with LabVIEW, Visual Studio (including VB Net, C#, C/C++), Keysight VEE [2]
  – Programming examples

**Step 2. Download free Keysight command expert software [3] (optional)**

FREE software that provides fast and easy instrument control for the PC. Command Expert combines instrument command sets, command sequences, documentation, syntax checking and command execution in one simple interface. Command Expert helps you to:

– Find instrument commands
– Access command documentation
– Verify command syntax
– Build instrument command sequences
– Execute instrument command sequences
– Integrate sequences in MATLAB, Visual Studio, Excel, LabVIEW, Keysight VEE or Keysight SystemVue PC application environment
– Generate code for command sequences in MATLAB, Visual C#, Visual Basic.NET and Visual C/C++
– Profile command execution time
– Debug command sequences using breakpoints and single stepping

1. Both IO library (version 16.2 or newer) and Connection Expert software need to be installed on the PC controlling the equipment.
2. Find latest versions of this software at www.keysight.com/find/m9380a.
3. To download or get more information on Command Expert, please visit www.keysight.com/find/commandexpert.

# F. Select Services–warranty, Calibration, Startup Assistance

| | | | |
|---|---|---|---|
| ◉ | | One day startup assistance | Included in base configuration |
| ◉ | Included | 3-year warranty (return to Keysight), standard | Included in base configuration |
| ○ | R-51B-001-5Z | 5-year return to Keysight warranty assurance plan | |
| ○ | M9380A-UK6 | Commercial calibration certificate with test data for M9380A (M9301A, M9310A) | Calibration certificate with measurement results available only at time of purchase. |
| ○ | M9300A-UK6 | Commercial calibration certificate with test data for M9300A | Calibration certificate with measurement results available only at time of purchase. |
| ○ | R1280X | Express Warranty - 5 day turnaround For 3 years | Available in the US, Japan, China and many EU countries |

## Global warranty

Keysight Technologies provides an excellent warranty service with all of its test and measurement equipment. It provides the peace of mind that today's high tech industry requires. Your investment is protected by Keysight's global reach in more than 100 countries (either directly or through distributors). The warranty gives you convenient standard coverage for the country in which the product is used, eliminating the need to ship equipment back to the country of purchase. Keysight's warranty service provides:

– All parts and labor necessary to return your investment to full specified performance

– Recalibration for products supplied originally with a calibration certificate

– Return shipment

## Express warranty

Reduce downtime with the fastest repair service in the industry. The express warranty upgrades the global warranty to provide:

– 5 day typical turnaround repair service in the US, Japan, China and many EU countries or up to a 10 day improvement in turnaround time in the rest of the world.

– Priority return shipment

## One day startup assistance

A Keysight Technologies applications engineer will get you started quickly by helping you install the modules in a chassis, configure the controller, load software and start making measurements.

## Calibration services

The modular products are factory calibrated and shipped with an ISO-9002, NIST-traceable calibration certificate. A one year calibration cycle is recommended. The M9380A is supported by the Keysight N7800A Calibration Software to perform calibrations that test all product specifications and is compliant with ISO 17025:2005, ANSI/NCSL Z540.3-2006 and Measurement Uncertainty per ISO Guide to Expression of Measurement Uncertainty 1995.

Product Information:  www.keysight.com/find/contactus
             Or call:  1 800 829-4444 US
Repair and Calibration:   www.keysight.com/find/infoline
Parts and Accessories:  www.parts.keysight.com
For all modular products:  www.keysight.com/find/modular
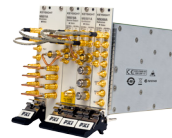
# G. Upgrades

Your product can be easily upgraded after the initial purchase. All PXIe CW Source options are controlled by a licensing key and can be quickly upgraded.

## How to upgrade your PXIe CW source:

1. Contact your Keysight representative to place an order for an option upgrade.
2. You will receive your hardware entitlement certificate via email.
3. Redeem the certificate online by following the instructions provided to receive a license key file.
4. Install the license key file using the Keysight License Manager.
5. Begin using the new capability.

# H. Related Product

| ○ | M9381A | PXIe Vector Signal Generator<br>See Configuration Guide<br>(literature no. 5991-0897EN) |  |

# Cable Connections for a Single M9380A CW Source

The following table and images describe the cables and required connections. Torque specification for all SMA connectors is 8 lb-In (0.904 Nm). An SMA 5/16 socket wrench and SMB/MMCX removal tool are provided with the M9380A.

All of the following parts are included with the M9380A. Replacement parts can be ordered separately.

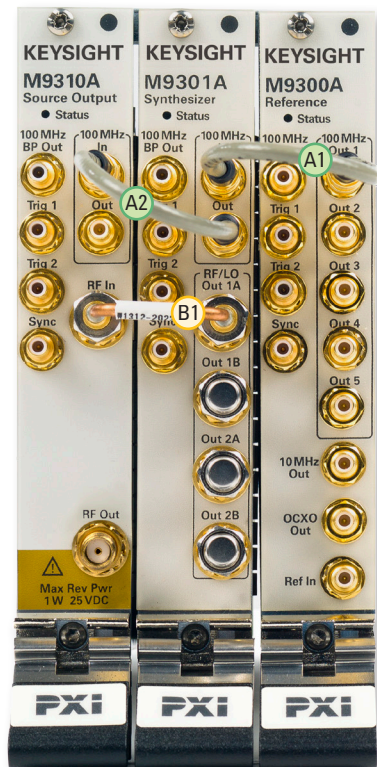| Reference Tag | Product Number | Connection | Cable description |
|---|---|---|---|
| Not shown | 8121-2063 | External reference into M9300A Ref In | Coaxial BNC (male) - SMB (female), right angle, 1200 mm |
| A1 | 8120-5091 | M9300A 100 MHz Out 1 to M9301A 100 MHz In | Coaxial SMB (female) - SMB (female) |
| A2 | 8120-5091 | M9301A 100 MHz Out to M9310A 100 MHz In | Coaxial SMB (female) - SMB (female) |
| B1 | W1312-20237 | M9301A RF/LO Out 1A to M9310A RF In | Semi-rigid, SMA (male) - SMA (male) |



Figure 3. Cable connections for the M9380A and M9300A.

# Using a M9380A in an Non–Keysight Chassis

The M9380A (with M9300A Frequency Reference) can be successfully installed in a non-Keysight chassis. Please use the following guidelines.
– Ensure that the chassis has 3 consecutive PXIe or PXI-H slots which can be used by the M9380A and M9300A.
– Ensure that the chassis and controller supports peer-to-peer PXI Express I/O switch topology.
– Ensure that controller selected is compatible with chassis.

For technical assistance with non-Keysight equipment, please refer to the equipment manufacturer's website.

# PC Requirements for M9380A Control[1]

|  | Windows 7 and Vista | Windows XP |
|---|---|---|
| Operating system | Windows 7 (32 & 64 bit)<br>Windows Vista, SP 1 & 2 (32 & 64 bit) | Windows XP, SP 3 |
| Processor speed | 1.5 GHz Dual Core (x86 or x64) minimum,<br>2.4 GHz recommended<br>No support for Itanium64 | 1.5 GHz Dual Core minimum,<br>2.4 GHz recommended |
| Available memory | 4 GB minimum<br>8 GB recommended | 3 GB minimum |
| Available disk space[3] | 1.5 GB available hard disk space includes:<br>1 GB for Microsoft.NET Framework 3.5 SPI[2]<br>100 MB for Keysight IO Libraries Suite | |
| Video | Support for DirectX 9 graphics with 128 MB graphics recommended<br>(SuperVGA supported) | SuperVGA (800 x 600) 256 colors or more |
| Browser | Microsoft Internet Explorer 7.0 or greater | Microsoft Internet Explorer 6.0 or greater |

1. For a list of computers compatible with Keysight Technologies PXIe M9018A Chassis, refer to Tested Computer Technical Overview (literature no. 5990-7632EN).
2. .NET Framework Runtime Components are installed by default with Windows Vista and Windows 7. Therefore, you may not need this amount of available disk space.
3. Because of the installation procedure, less memory may be required for operation than is required for installation.

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| Germany | 0800 6270999 |
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