

NI-Serial for LabVIEW Real-Time, Version 19.0 Readme

May 2019

Thank you for using NI-Serial for LabVIEW Real-Time, Version 19.0.

This file contains important information about NI-Serial for LabVIEW Real-Time, including installation instructions, new features, a partial list of bugs fixed for NI-Serial for LabVIEW Real-Time, and known issues.

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System Requirements

- Supported Versions of the LabVIEW Real-Time Module
 - LabVIEW Real-Time 2019
 - LabVIEW Real-Time 2018
 - LabVIEW Real-Time 2017
 - LabVIEW Real-Time 2016
 - LabVIEW Real-Time 2015
 - LabVIEW Real-Time 2014 SP1
 - LabVIEW Real-Time 2013 SP1
 - LabVIEW Real-Time 2012 SP1

To download previous versions of NI-Serial for LabVIEW Real-Time drivers, refer to ni.com/updates and search for *NI-Serial*.

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Product Security and Critical Updates

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Changes and Fixed Issues

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Changes and Fixed Issues in Version 19.0

Added Support for PCI Express Serial Hardware on Controllers Running 64-Bit NI Linux Real-Time OS

NI-Serial 19.0 adds support for National Instruments PCI Express serial interfaces for controllers, such as the PXIe-8840, PXIe-8861, and PXIe-8881, that run 64-bit NI Linux Real-Time OS.

Changes and Fixed Issues in Version 18.5

Added Support for PCI Express Serial Hardware

NI-Serial 18.5 adds support for National Instruments PCI Express serial interfaces. Refer to [Supported Interfaces](#).

Changes and Fixed Issues in Version 17.5

No Changes

There are no changes to NI-Serial 17.5 for LabVIEW Real-Time.

Changes and Fixed Issues in Version 17.0

Removed Support for Various PCI and PXI Interfaces

NI-Serial 17.0 removes support for the PCI-232, PCI-232I, PCI-485, PCI-485I, PXI-8420, PXI-8421, PXI-8422, and PXI-8423 interfaces.

Changes and Fixed Issues in Version 15.0

Added support for NI 9870 and NI 9871 C Series modules on sbRIO-9607 and sbRIO-9627

NI-Serial 15.0 adds serial module (NI 9870 and NI 9871) support for the sbRIO-9607 and sbRIO-9627 controllers.

Changes and Fixed Issues in Version 14.0

Added support for NI 9870 and NI 9871 C Series modules on controllers running 64-bit NI Linux Real-time OS

NI-Serial 14.0 adds serial module (NI 9870 and NI 9871) support for controllers, such as the NI cRIO-9038, which run 64-bit NI Linux Real-time OS.

445885: RS-232 ports on NI 9870 modules are incorrectly detected as RS-485 ports

NI-Serial 14.0 fixes a known issue when running NI Linux Real-time OS, where NI-Serial incorrectly causes NI-VISA to detect RS-232 ports on NI 9870 modules as RS-485 configured for 4-wire mode.

Changes and Fixed Issues in Version 4.1

Added support for NI 9870 and NI 9871 C series modules on the cRIO-9068.

NI-Serial 4.1 adds serial module (NI 9870 and NI 9871) support for the cRIO-9068 controller.

356028: NI 9870 and NI 9871 C series modules do not detect errors in all cases.

NI-Serial 4.1 fixes an issue where some parity and framing errors received by NI 9870 and NI 9871 modules are not detected by the firmware. This can result in the driver not reporting the errors, leading to data corruption.

Changes and Fixed Issues in Version 4.0

Added support for NI CVS-1457RT Compact Vision System

Improved Support for NI System Configuration API

NI-Serial 4.0 adds the discovery of NI 9870 and NI 9871 modules through the NI System Configuration API.

NI System Configuration Expert Name Change

The NI System Configuration expert for NI-Serial has been renamed from "ni-serial" to "serial." This change allows for system configuration and MAX import/export operations to be accessed in a consistent manner. Existing applications using the old name will need to be updated.

387524: Incorrect Slot and Chassis Identification

When using the NI System Configuration API to query information about NI-Serial PCI or PCIe hardware in a Desktop RT system, it would incorrectly specify that the board was in slot 255 of chassis PXI255. This has been resolved, and now reports that the chassis and slot are unavailable.

Improved Appearance in MAX

NI-Serial 4.0 improves the way serial hardware is displayed in MAX. PXI and PXIe hardware are now displayed under their respective chassis in the tree. NI 9870 and NI 9871 modules will also now appear in MAX when configured for use with NI-Serial.

When using a host system with NI-Serial 4.0 installed to view LabVIEW Real-Time controllers running older versions of NI-Serial, the NI-Serial boards will no longer appear in MAX. All ports will still be accessible as VISA ASRL resources.

Changes and Fixed Issues in Version 3.9.1

Update shortcuts installed on Windows 8

When installing on Windows 8, NI-Serial no longer pins shortcuts to the Start screen. Shortcuts which are available from the start menu on earlier versions of Windows may be accessed through the *NI Launcher* utility, or by searching from the Start screen.

Changes and Fixed Issues in Version 3.9

Added support for updated Smart Cameras

Support for NI System Configuration API

NI-Serial 3.9 supports the discovery of PCI-based (PCI, PCIe, PXI, and PXIe) hardware through the NI System Configuration API.

359904: System Instability every 49.7 days

NI-Serial 3.9 fixes an issue where various errors could be manifested if a serial transfer is in progress when the 32-bit system tick count rolls over, which happens once every 49.7 days. Symptoms included failed serial transfers, FIFO overruns, failure of serial transfers to timeout, and system hangs.

Changes and Fixed Issues in Version 3.8.2

ID 347232: System could hang during reboot

A system could hang during reboot if it was transmitting data from a 843x series serial port when the reboot command was sent. This has been fixed.

ID 337167: Possible crash with cRIO-9075, cRIO-9076, sbRIO-9605, or sbRIO-9606 controllers

A system crash or instability could occur when detecting serial ports on any of the mentioned controllers. Some examples when this could occur are expanding Devices & Interfaces in Measurement & Automation Explorer, installing VISA Server on the target, or attempting to use a serial port. This has been fixed.

ID 328853: Serial ports not functioning on cFP-2100 and cFP-2110 controllers

The serial ports on cFP-2100 and cFP-2110 controllers were not properly detected. This did not impact cFP-2120 controllers. This has been fixed.

Changes and Fixed Issues in Version 3.8.1

Support for New Controllers

NI-Serial 3.8.1 adds support for serial ports on RIO Mezzanine Cards.

SecondaryInterrupts option in niseriial.dbs has been replaced

The SecondaryInterrupts option used in the `niseriial.dbs` file has been replaced, and will no longer function. Refer to the *Performance on LabVIEW Real-Time* topic in the *NI-Serial Help* for more information.

ID 132892: Incorrect behavior when using NI-VISA VI_EVENT_ASRL_RI event

When using the VI_EVENT_ASRL_RI event with some cRIO, sbRIO, and cFP controllers, the event was incorrectly signaled on both rising and falling edges of the RI line. This behavior has now been fixed, and the event is signaled only on the falling edge.

Changes and Fixed Issues in Version 3.8

Performance Optimizations for Small Transfers

Several enhancements have been made to improve performance and decrease CPU overhead when performing small writes on all interfaces, and small reads on NI 843x series hardware.

Support for New Controllers

NI-Serial 3.8 adds support for additional cRIO, sbRIO, and Smart Camera controllers.

Port numbering change for some systems

NI-Serial now reserves port numbers for two built-in serial ports on all PXI, Industrial Controller, Desktop RT, and cRIO-908x controllers. On these systems, PnP hardware will now be assigned port numbers starting with COM3, when they may have previously been assigned COM2.

NI-Serial settings no longer persist after uninstall

The `niseriial.dbs` file is replaced each time NI-Serial is uninstalled or reinstalled. This has the effect that any customized settings will be removed. This matches the behavior of NI-Serial 3.6 and earlier.

Removed support for FP-20xx and cFP-20xx controllers.

NI-Serial for LabVIEW Real-Time, Version 3.8, requires LabVIEW Real-Time 8.6 or later. It is not possible to install on FP-20xx or cFP-20xx controllers. These controllers will continue to work with previous versions of NI-Serial.

ID 298769: Incorrect Parity Setting

Mark and space parity were not properly configured on some cRIO, sbRIO, and cFP controllers. This has been fixed.

ID 288089: Flow control may not disengage

When using multiple forms of flow control simultaneously on a single port, it was possible for flow control to fail to disengage, preventing data transmission. This has been fixed.

ID 287461: Possible loss of data preceding serial error

Several bytes of valid data could be discarded immediately prior to the reception of a serial error, such as a parity or overrun error. This valid data is now properly received prior to handling the error condition.

ID 286317: Data reception could halt

When the RX FIFO became completely full on some cRIO, sbRIO, and cFP controllers, the port could stop receiving data. This has been fixed.

ID 288079: Possible crash when rebooting cRIO while using NI 987x modules

It was possible for a cRIO controller to crash during reboot when using serial ports on a C Series module. This has been fixed.

ID 277876: Controller may hang on reboot

In some rare circumstances, the process of shutting down serial ports for a reboot could cause the controller to hang. This has been fixed.

Changes and Fixed Issues in Version 3.7.1

Add support for the NI cRIO-9075/6 Controller

NI-Serial for LabVIEW Real-Time, Version 3.7.1, adds support for the NI cRIO-9075 and cRIO-9076 Controllers.

Changes and Fixed Issues in Version 3.7

NI 9870 and NI 9871 Modules

NI-Serial 3.7 allows users to access the NI 9870 and 9871 modules directly from LabVIEW Real-Time 2010 without using the LabVIEW FPGA interface.

To enable this support, install NI-Serial 3.7 and NI-VISA for LabVIEW Real-Time on a Compact RIO Target that supports RIO Scan Interface (RSI). When detecting the modules, users will have the option to add the module directly to the chassis in the LabVIEW project.

If using NI-RIO 3.5.x and lower, you may see warning pop-ups indicating that the NI 987x modules are not supported on RSI. These warnings can be ignored. For more information go to ni.com/kb and search for *5DTFTOL1*.

Port Numbering Behavior

NI-Serial 3.7 changes the way that ports are numbered when detecting boards. Under some circumstances inserting new boards into a system may cause port numbers to change. For more information go to ni.com/kb and search for *5D2G85G2*.

Serial Settings Persist after Uninstall

The behavior of settings on uninstall was reverted in NI-Serial 3.8. Please refer to [Changes and Fixed Issues in NI-Serial 3.8](#) for more information.

Serial settings stored in the `niserial.dbs` file, including port numbers, will persist after uninstalling NI-Serial 3.7 from a Real-Time target. The modifications to the `niserial.dbs` file will also persist through reinstalls of the NI-Serial driver. To reset these settings to default, delete the `niserial.dbs` file from the Real-Time target.

Changes and Fixed Issues in Version 3.6

Add support for PXI Express serial hardware

NI-Serial for LabVIEW Real-Time, Version 3.6, adds support for National Instruments PXI Express serial interfaces. Refer to the chart of [Supported Interfaces](#) for detailed model information.

NI PXIe-8431 hardware adds support for higher baud rates

For some applications, it may be possible to use a NI PXIe-8431 interface for communicating at up to 10 MBaud. For more information go to ni.com/kb and search for *58KEI82F*.

PXI chassis and slot information

When upgrading to NI-Serial 3.6 on some configurations, port assignments may change. For best results, please identify all PXI chassis through Measurement & Automation Explorer.

Issues resolved in NI-Serial for LabVIEW Real-Time Version 3.6

ID 193240: A hang could occur when using Asynchronous IO in a Timed Loop on LabVIEW Real-Time.

Changes and Fixed Issues in Version 3.5.2

Add support for PCI Express serial hardware

NI-Serial for LabVIEW Real-Time, Version 3.5.2, adds support for National Instruments PCI Express serial interfaces. Refer to the chart of [Supported Interfaces](#) for detailed model information.

Add support for cRIO-9024 and cRIO-9073 controllers

NI-Serial for LabVIEW Real-Time, Version 3.5.2, adds support for the cRIO-9024 and cRIO-9073 controllers.

Add support for NI 9792

NI-Serial for LabVIEW Real-Time, Version 3.5.2, adds support for the NI 9792 controller.

On-chip flow control

NI-Serial for LabVIEW Real-Time, Version 3.5.2, adds support for on-chip flow control. Previous driver versions implemented flow control in the driver, which in some circumstances could allow data loss. All PCI, PXI, and PCI Express interfaces now utilize on-chip RTS/CTS flow control. 8430-series hardware also supports on-chip DTR/DSR and XON/XOFF flow control.

Performance changes for some cRIO, cFP, and sbRIO controllers:

NI-Serial 3.5.2 includes performance changes that impact cRIO-901x, cRIO-907x, sbRIO-96xx, and cFP-22xx controller families. This change greatly reduces the CPU overhead of reading data from the serial port at high speed. An impact of this change is that increased latency may be seen when reading small numbers of bytes from the serial port. For more information about this change and possible solutions if you have issues with the increased latency, visit ni.com/kb and search for Knowledgebase 55597DG2.

Issues resolved in NI-Serial for LabVIEW Real-Time Version 3.5.2

- **ID 111717:** When viewing threads through the Execution Trace Toolkit, some NI-Serial threads were unnamed.
- **ID 200568:** When entering custom settings in the `niserial.dbs` file, it was possible for them to be deleted from the file upon reboot instead of being applied to the driver.

Changes and Fixed Issues in Version 3.3.4

Add support for NI 31xx and EVS-146x controllers

NI-Serial for LabVIEW Real-Time, Version 3.3.4, adds support for the NI 3100, NI 3110, and EVS-146x controllers.

Changes and Fixed Issues in Version 3.3.3

Add support for the NI cRIO-9022 Controller

NI-Serial for LabVIEW Real-Time, Version 3.3.3, adds support for the NI cRIO-9022 Controller.

Issues resolved in NI-Serial for LabVIEW Real-Time Version 3.3.3

ID 112229: Using Restore Defaults through Measurement & Automation Explorer restored incorrect FIFO settings for some ports on PXI and Desktop RT controllers.

Changes and Fixed Issues in Version 3.3.2

Add support for NI sbRIO Controllers

NI-Serial for LabVIEW Real-Time, Version 3.3.2, adds support for NI sbRIO controllers.

Add support for NI Smart Camera Controllers

NI-Serial for LabVIEW Real-Time, Version 3.3.2, adds support for NI 17xx Smart Cameras.

Issues resolved in NI-Serial for LabVIEW Real-Time Version 3.3.2

- **ID 93992:** Use of modem line change events could result in system hang on various controllers.
- **ID 94261:** cFP or cRIO controllers could fail to detect modem line changes or properly time out an I/O request.
- **ID 55220:** System could hang if a UART error occurred while reading data from the FIFO.
- **ID 73422:** Use of modem line change events could result in system hang on some cRIO and cFP controllers.
- **ID 73002:** Repeated Open/Close operations could cause system instability on some cRIO, cFP, and Smart Camera controllers.

Changes and Fixed Issues in Version 3.3

Add support for LabVIEW Real-Time 8.5 with SMP Extensions

NI-Serial for LabVIEW Real-Time, Version 3.3, adds support for multi-core real-time targets.

Add support for new National Instruments Real-Time Controllers

NI-Serial for LabVIEW Real-Time, Version 3.3, adds support for the cRIO-9072, and cRIO-9074 controllers.

Issues resolved in NI-Serial for LabVIEW Real-Time Version 3.3

- Incoming data could sometimes fail to be read if the port of a cRIO-9002/9004 was opened with data streaming to the port.
- Some controllers could have experienced a system hang if a line error were received while the port was in the process of closing.
- Under some conditions the serial driver could fail to properly time out an I/O Request.

Changes in Version 3.2

Add support for report generation in Measurement & Automation Explorer

NI-Serial for LabVIEW Real-Time, Version 3.2, adds support for report generation in Measurement & Automation Explorer (MAX). Report generation allows you to take a snapshot of what hardware is installed and configured on your system.

Changes in Version 3.1

Add support for built-in ports on cRIO, FieldPoint, and Compact Vision controllers

NI-Serial for LabVIEW Real-Time, Version 3.1, adds support for cRIO, FieldPoint, and Compact Vision controllers running LabVIEW Real-Time.

Changes in Version 3.0

Add support PCI/PXI-843x hardware

NI-Serial for LabVIEW Real-Time, Version 3.0, adds support for the new PCI/PXI-843x family of hardware.

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Supported Interfaces

- [PCI](#)
- [PCI Express](#)
- [PXI](#)
- [PXI Express](#)
- [Real-Time Controllers](#)
- [Serial C Series Modules](#)

PCI Interfaces	Standard	# Ports	Isolated	Max Baud (kbaud)
PCI-8430/2	RS-232	2	No	1000.0
PCI-8430/4	RS-232	4	No	1000.0
PCI-8430/8	RS-232	8	No	1000.0
PCI-8430/16	RS-232	16	No	1000.0
PCI-8431/2	RS-485/RS-422	2	No	3000.0 ¹
PCI-8431/4	RS-485/RS-422	4	No	3000.0 ¹
PCI-8431/8	RS-485/RS-422	8	No	3000.0 ¹
PCI-8432/2	RS-232	2	Yes	1000.0
PCI-8432/4	RS-232	4	Yes	1000.0
PCI-8433/2	RS-485/RS-422	2	Yes	3000.0 ¹
PCI-8433/4	RS-485/RS-422	4	Yes	3000.0 ¹

PCI Express Interfaces	Standard	# Ports	Isolated	Max Baud (kbaud)
NI PCIe-8430/2	RS-232	2	No	1000.0
NI PCIe-8430/8	RS-232	8	No	1000.0
NI PCIe-8430/16	RS-232	16	No	1000.0
NI PCIe-8431/2	RS-485/RS-422	2	No	3000.0 ¹
NI PCIe-8431/8	RS-485/RS-422	8	No	3000.0 ¹
NI PCIe-8431/16	RS-485/RS-422	16	No	3000.0 ¹
NI PCIe-8432/2	RS-232	2	Yes	1000.0 ¹
NI PCIe-8433/2	RS-485/RS-422	2	Yes	1000.0 ¹

PXI Interfaces	Standard	# Ports	Isolated	Max Baud (kbaud)
PXI-8430/2	RS-232	2	No	1000.0
PXI-8430/4	RS-232	4	No	1000.0
PXI-8430/8	RS-232	8	No	1000.0
PXI-8430/16	RS-232	16	No	1000.0

PXI-8431/2	RS-485/RS-422	2	No	3000.0 ¹
PXI-8431/4	RS-485/RS-422	4	No	3000.0 ¹
PXI-8431/8	RS-485/RS-422	8	No	3000.0 ¹
PXI-8432/2	RS-232	2	Yes	1000.0
PXI-8432/4	RS-232	4	Yes	1000.0
PXI-8433/2	RS-485/RS-422	2	Yes	3000.0 ¹
PXI-8433/4	RS-485/RS-422	4	Yes	3000.0 ¹

PXI Express Interfaces	Standard	# Ports	Isolated	Max Baud (kbaud)
NI PXIe-8430/8	RS-232	8	No	1000.0
NI PXIe-8430/16	RS-232	16	No	1000.0
NI PXIe-8431/8	RS-485/RS-422	8	No	3000.0 ^{1, 2}
NI PXIe-8431/16	RS-485/RS-422	16	No	3000.0 ^{1, 2}

Real-Time Controllers	Standard	# Ports	Isolated	Max Baud (kbaud)
cDAQ-913x ⁴	RS-232 RS-485/422	1 1 ⁵	No Yes	115.2 230.4
cFP-2100	RS-232	1	No	115.2
cFP-2110	RS-232	2	No	115.2
cFP-2120	RS-232 RS-485/422	3 1 ^{5, 6}	No No	115.2 115.2
cFP-2200	RS-232	1	No	115.2
cFP-2210	RS-232	2	No	115.2
cFP-2220	RS-232 RS-485/422	3 1 ⁵	No No	115.2 230.4
cRIO-900x	RS-232	1	No	115.2
cRIO-901x	RS-232	1	No	230.4
cRIO-902x	RS-232	1	No	230.4
cRIO-907x	RS-232	1	No	230.4
cRIO-908x ⁴	RS-232 RS-485/422	1 1 ⁵	No Yes	115.2 230.4
CVS-1454 CVS-1456	RS-232	1	No	115.2
CVS-1457RT	RS-485/422	1	No	115.2
Desktop RT	RS-232	1/2	No	115.2
EVS-146x	RS-232	1	No	115.2
NI 172x Smart Cameras	RS-232	1 ⁵	No	230.4
NI 174x Smart Cameras	RS-232	1 ⁵	No	230.4
NI 176x Smart Cameras	RS-232	1 ⁵	No	230.4
NI 177x Smart Cameras	RS-232	1 ⁵	No	115.2
NI 31xx	RS-232	1	No	115.2
NI 9792	RS-232	1	No	230.4
PXI Controllers	RS-232	1/2	No	115.2
sbRIO-96xx	RS-232	1	No	230.4

Serial C Series Modules ⁷	Standard	# Ports	Isolated	Max Baud (kbaud)
NI 9870	RS-232	4	Yes	115.2
NI 9871	RS-485	4	Yes	115.2

¹The two-wire auto control mode for RS-485 transceiver control has a maximum baud rate of 2 Mbaud.

²For possible use with higher baud rates, refer to ni.com/kb and search for KnowledgeBase 58KEI82F.

³NI-Serial for LabVIEW Real-Time does not provide native driver support for Serial ENET interfaces. However, you may use your Serial ENET interfaces on LabVIEW Real-Time through the NI-VISA Serial ENET Passport.

⁴NI-Serial interfaces cannot currently be used across the MXI interface on cRIO-908x and cDAQ-913x controllers.

⁵This port supplies connections only for transmit, receive, and ground.

⁶This port supports only the 4-wire transceiver control mode.

⁷Serial C Series Modules may be used through NI-Serial and NI-VISA on backplanes configured to use *NI-RIO IO Scan*. To enable this support, *NI-Serial 9870 and 9871 Scan Engine Support* must be installed on the controller. For assistance with configuring a controller and backplane to use *NI-RIO IO Scan*, please refer to the NI-RIO documentation.

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