The National Instruments NAT9914 Series are drop-in replacement chips for the Texas Instruments TMS9914A Controller. The NAT9914BPD, NAT9914BPL, and NAT9914BPQ are drop-in replacement parts for the Texas Instruments TMS9914A 40-pin DIP, 44-pin PLCC, and 44-pin QFP packages, respectively. The NI NAT9914 is 100 percent register and pin compatible with the TMS9914A on power-up, but has complete IEEE 488.2 Controller functionality through software. You can program the IEEE 488.2 Controller without hardware changes, you should consider using the NAT9914. Furthermore, because the NAT9914 can accept faster clock inputs, performance increases without substantial firmware changes.

### Overview

The National Instruments NAT9914BPD, NAT9914BPL, and NAT9914BPQ are drop-in replacement parts for the Texas Instruments TMS9914A 40-pin DIP, 44-pin PLCC, and 44-pin QFP packages, respectively. The NI NAT9914 is 100 percent register and pin compatible with the TMS9914A on power-up, but has additional features present in the TMS9914A. The NAT9914 performs complete IEEE 488 Talker, Listener, and Controller functions. The NAT9914 has the complete register set and the identical pin configuration of the TMS9914A on power-up, but has complete IEEE 488.2 Controller functionality through software. You can take advantage of IEEE 488.2 with minimal software changes. Although the default clock input is 5 MHz, the NAT9914 can use clock input values up to 20 MHz for increased performance. The NAT9914 can also run in NEC µPD7210 register-compatible mode with a software command.

### General Architecture

The NAT9914 manages the IEEE 488 bus. You can program the IEEE 488 bus by writing control words into the appropriate registers. CPU-readable status registers supply operational feedback. The NAT9914 mode determines the function of these registers. On power-up or reset, the NAT9914 registers resemble the TMS9914A register set, with additional registers that supply extra functionality and IEEE 488.2 compatibility. In this mode, the NAT9914 is completely pin-compatible with the TMS9914A. If you enable the 7210 mode, the registers resemble those of the NEC µPD7210 set, with additional registers that supply extra functionality and IEEE 488.2 compatibility. This mode is not pin compatible with the NEC µPD7210.
RoHS Compliance

The NAT9914 is currently available from NI both in a standard package and as a RoHS-compliant chip. You can order the chips using the part numbers shown below. The RoHS-compliant parts are identified through the added “F” at the end of the part number and the chip itself is marked with an e3 inside an ellipse to indicate a pure tin lead finish in accordance with the marking recommendations defined in JEDEC JESD97. The RoHS-compliant NAT9914 ASICs have a matte pure tin finish on their leads.

The RoHS-compliant NAT9914 meets industry requirements for baking and maximum solder reflow temperature. The baking requirements are outlined in JEDEC J-STD-033, and NI recommends using the solder reflow profile as shown in IPC/JEDEC J-STD-020C with a peak temperature of 260 °C, the maximum temperature they can withstand. The Moisture Sensitivity Level (MSL) for the RoHS-compliant surface mount NAT9914 ASICs is 3 (the MSL is not applicable to the NAT9914BPDF through-hole device).

Ordering Information

NI NAT9914BPD (40-pin DIP package)
  RoHS-compliant ..............................................NAT9914BPDF-9
  Standard ........................................................NAT9914BPD-9
  Sample kit (RoHS-compliant, 2 ASICs) ..................776730-01
NI NAT9914BPL (44-pin PLCC package)
  RoHS-compliant ..............................................NAT9914BPLF-27
  Standard ........................................................NAT9914BPL-27
  Sample kit (RoHS-compliant, 2 ASICs) ..................776730-02
NI NAT9914BPQ (44-pin QFP package)
  RoHS-compliant ..............................................NAT9914BPQF-84
  Standard ........................................................NAT9914BPQ-84
  Sample kit (RoHS-compliant, 4 ASICs) ..................776730-03

Visit ni.com for a more detailed reference manual and data sheet.

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We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit ni.com/ssp.

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NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with ni.com/pxiadvisor.

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NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit ni.com/calibration.

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