

Drop-In Replacement Chip for NEC μ PD7210 Controller

NI NAT7210 **NEW!**

- RoHS-compliance option
- Register and pin-compatible with NEC μ PD7210
- Software-compatible with NEC μ PD7210 or TI TMS9914A controller chips
- Low-power CMOS design
- Meets all IEEE 488.2 requirements
 - Bus line monitoring
 - Preferred implementation of requesting service
 - No messages sent when there are no listeners
- 20 MHz maximum programmable clock rate
- Programmable data transfer rate with T1 delays of 350 ns, 500 ns, 1.1 μ s, and 2 μ s
- Internal timer interrupt
- Automatic EOS and/or NL message detection
- Handles DMA transfers
- Programmatically compatible with GPIB bus transceivers (TI, National Semiconductor, Motorola, and Intel)



Overview

The National Instruments NAT7210 is a 40-pin DIP drop-in replacement part for the NEC μ PD7210. The NAT7210 is 100 percent register and pin compatible with the NEC μ PD7210 on power-up and has additional features in the NAT4882 IEEE 488.2 controller chip. Thus, the NAT7210 can perform all interface functions defined by ANSI/IEEE Standard 488.1-1987 and meet the additional requirements and recommendations of ANSI/IEEE Standard 488.2-1992. The NAT7210 performs complete IEEE 488 talker, listener, and controller functions.

On power-up, the NAT7210 has the complete register set of NEC μ PD7210, but it has complete IEEE 488.2 controller functionality through software. Thus, you can take advantage of IEEE 488.2 with minimal software modifications, yet retain the 40-pin package and hardware pin configuration. The default clock for the NAT9914 is 5 MHz and for the NAT7210 is 8 MHz; however, other input values up to 20 MHz are software selectable in the NAT7210 for increased performance. The NAT7210 can run in TI TMS9914A register-compatible mode with a software command.

If you are looking for alternatives to existing NEC μ PD7210 chip suppliers or planning to upgrade your designs to IEEE 488.2 without hardware changes, you should consider using the NAT7210. Furthermore, because the NAT7210 can accept faster clock inputs, performance increases without substantially changing the firmware.

T/R1	1	40	VCC
T/R2	2	39	EOI#
CLK	3	38	NDAC#
RESET	4	37	NRFD#
T/R3	5	36	DAV#
DRQ	6	35	DIO8#
DACK#	7	34	DIO7#
CS#	8	33	DIO6#
RD#	9	32	DIO5#
WR#	10	31	DIO4#
INT	11	30	DIO3#
D0	12	29	DIO2#
D1	13	28	DIO1#
D2	14	27	SRQ#
D3	15	26	ATN#
D4	16	25	REN#
D5	17	24	IFC#
D6	18	23	RS2
D7	19	22	RS1
GND	20	21	RS0

Figure 1. NAT7210 Pin Configuration

General Architecture

The NAT7210 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 NAT7210 mode determines the function of these registers. When in 7210 mode, the registers resemble the μ PD7210 register set with additional registers that supply extra functionality and IEEE 488.2 compatibility. In this mode, the NAT7210 is completely pin compatible with the NEC μ PD7210. When in 9914A mode, the registers resemble the TMS9914A register set with additional registers that supply extra functionality and IEEE 488.2 compatibility.

Drop-In Replacement Chip for NEC μPD7210 Controller

RoHS Compliance

The NAT7210 is currently available from NI both in a standard package and as a RoHS-compliant chip. You can order 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 NAT7210 ASICs also have a matte pure tin finish on their leads.

The RoHS-compliant NAT7210 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.

Ordering Information

NI NAT7210BPD (40-pin DIP package)

RoHS-compliant	NAT7210BPDF-9
Standard	NAT7210BPD-9
Sample kit (RoHS-compliant, 2 ASICs)	776730-11

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

BUY NOW!

For complete product specifications, pricing, and accessory information, call (800) 813 3693 (U.S.) or go to ni.com/gpib.

NI Services and Support



NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit ni.com/services.

Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit ni.com/training.

Professional Services

Our Professional Services Team is composed of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and

integrators. Services range from start-up assistance to turnkey system integration.

Visit ni.com/alliance.



OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at ni.com/support.

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

Hardware Services

NI Factory Installation Services

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.

Calibration Services

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.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit ni.com/services.



ni.com • (800) 813 3693

National Instruments • info@ni.com



351422A-01

2005-6161-385-101-D