
TS-15010

Specifications

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TS-15010 Specifications

Conditions

Specifications are typical under the following conditions unless otherwise noted.

- Ambient temperature of 0 °C to 55 °C. The ambient temperature is defined as the temperature at the enclosure fan inlet (air intake). Refer to the ***Thermal Considerations*** topic in the backplanes documentation on ni.com/docs for additional information on ambient temperature characteristics and cooling requirements.
- All voltages relative to COM

Analog Input

Input FIFO size	127 samples per slot
Maximum sample rate	Determined by the TestScale I/O module or modules



Note Performance dependent on type of installed TestScale I/O module and number of channels in the task.

Timing accuracy	50 ppm of sample rate
Timing resolution	12.5 ns



Note Timing accuracy and timing resolution specifications do not include group delay. For more information, refer to the documentation for each

TestScale I/O module.

Number of channels supported	Determined by the TestScale I/O module or modules
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Analog Output

Number of channels supported, hardware-timed task	
Onboard regeneration	16
Non-regeneration	Determined by the TestScale I/O module or modules

Number of channels supported, non-hardware-timed task	Determined by the TestScale I/O module or modules
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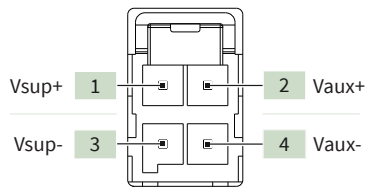
Maximum update rate	
Onboard regeneration	1.6 MS/s (multi-channel, aggregate)
Non-regeneration	Determined by the TestScale I/O module or modules

Timing accuracy	50 ppm of sample rate
Timing resolution	12.5 ns

Output FIFO size	
Onboard regeneration	8,191 samples shared among channels used
Non-regeneration	127 samples per slot
AO waveform modes	Non-periodic waveform, periodic waveform regeneration mode from onboard memory, periodic waveform regeneration from host buffer including dynamic update

TS-15010 Pinout

Figure 1. TS-15010 Power Connector Pinout (Vsup and Vaux)



The TestScale backplanes have two four-pin power connectors to supply power to the entire TestScale assembly.

- Vsup—Supplies power to the backplane components and to all module slots.
- Vaux—Increases available current to any installed modules with high-power requirements, such as programmable power supplies. Refer to your module specifications for Vaux power consumption information.

Digital Waveform Characteristics

Waveform acquisition (DI) FIFO	127 samples per slot
Waveform generation (DO) FIFO	

Slots 1 to 4	2,047 samples
Slots 5 and core module slot	1,023 samples



Note When modules are installed in slots 1 through 4, FIFO is 2,047 samples per slot for all slots. When any module is installed in slot 5 or in the core module slot with DO, FIFO is 1,023 samples per slot for all slots.

Digital input sample clock frequency	
Streaming to application	System-dependent memory
Finite	0 to 10 MHz

Digital output sample clock frequency	
Streaming from application	System-dependent memory
Regeneration from FIFO	0 MHz to 10 MHz
Finite	0 MHz to 10 MHz

Timing accuracy	50 ppm
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General-Purpose Counters/Timers

Number of counters/ timers	4
Resolution	32 bits
Counter measurements	Edge counting, pulse, semi-period, period, two-edge separation, pulse width
Position measurements	X1, X2, X4 quadrature encoding with Channel Z reloading; two-pulse encoding
Output applications	Pulse, pulse train with dynamic updates, frequency division, equivalent time sampling
Internal base clocks	80 MHz, 20 MHz, 100 kHz
External base clock frequency	0 MHz to 20 MHz
Base clock accuracy	50 ppm
Output frequency	0 MHz to 20 MHz
Inputs	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down
Routing options for	Any module PFI, analog trigger, many internal signals

inputs	
FIFO	Dedicated 127-sample FIFO

Frequency Generator

Number of channels	1
Base clocks	20 MHz, 10 MHz, 100 kHz
Divisors	1 to 16 (integers)
Base clock accuracy	50 ppm
Output	Any module PFI terminal

Module PFI Characteristics

Functionality	Static digital input, static digital output, timing input, and timing output
Timing output sources	Many analog input, analog output, counter, digital input, and digital output timing signals



Note Actual signals available dependent on type of installed TestScale I/O module.

Timing input frequency	0 MHz to 20 MHz
Timing output frequency	0 MHz to 20 MHz

Digital Triggers

Source	Any module PFI terminal
Polarity	Software-selectable for most signals
Analog input function	Start Trigger, Reference Trigger, Pause Trigger, Sample Clock, Sample Clock Timebase
Analog output function	Start Trigger, Pause Trigger, Sample Clock, Sample Clock Timebase
Counter/timer function	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down

Module I/O States

At power-on	Module-dependent. Refer to the documentation for each TestScale I/O module.
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Note The device may revert the input/output of the modules to their power-on state when the USB cable is removed.

USB Port Interface

Host	
Number of ports	2
USB specification	USB 2.0 Hi-Speed
VBus current	500 mA maximum per port
Device	
Number of ports	1
USB specification	USB 2.0 Hi-Speed

Power Requirements

Input voltage range (Vsup and Vaux)	11 V to 28 V
Power consumption from Vsup	13.5 W maximum
Thermal dissipation	2.6 W maximum



Note The **Power Considerations** topic in the backplanes documentation on ni.com/docs contains additional information required to determine the total power requirements for your TestScale backplane. Refer to the **Power Considerations** topic for information on determining the total Vsup and

Vaux input power for the TestScale system.

Power input connector, Vsup and Vaux	4 positions, 3.5 mm pitch, dual row connector rated to 11 A maximum, similar to Molex Ultra-Fit Vertical Header 172299-1204
Power input mating connector	Molex Ultra-Fit Tangless Receptacle Housing 1722583104 with Molex crimp terminal 1722536011, or equivalent
Power consumption from USB, 4.10 to 5.25 V	500 μ A maximum

Cooling

Module cooling system	Forced air circulation (positive pressurization) through single static 18,000 RPM fan
Module cooling intake	Rear of the system
Module cooling exhaust	Along both sides of the system

Physical Characteristics

Dimensions	Visit ni.com/dimensions and search by backplane model number.
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If you need to clean the device, wipe it with a dry towel.

Environmental Characteristics

Table 1. Temperature

Operating	0 °C to 55 °C
Storage	-40 °C to 71 °C

Table 2. Humidity

Operating	10% to 90%, noncondensing
Storage	5% to 95%, noncondensing

Table 3. Pollution Degree

Pollution degree	2
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Table 4. Maximum Altitude

Maximum altitude	2,000 m
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Table 5. Shock and Vibration

Operating vibration	5 Hz to 500 Hz, 0.3 g RMS
Non-operating vibration	5 Hz to 500 Hz, 2.4 g RMS
Operating shock	30 g, half-sine, 11 ms pulse