UEISIM Cubes and RACKs

Simulink® and RTW I/O Targets

- *Now supporting Cube, GigE Cube, and RACKtangle chassis!*
- Powerful, compact and rugged
- Flexible: Over 40 I/O boards available including A/D, D/A, Digital I/O, Counter/Timer, Quadrature encoder, Serial, CAN and ARINC 429 communications.
- Standard Linux OS (3.4.x Kernel)
- Standard Ethernet 100Base-T or GigE Interface
- Supports up to 5k "loops" per second
- Ideal for HIL (Hardware-in-the-loop) applications
- Ideal for development, prototype and production

The UEISIM is available on PPC Cube, GigE Cube and RACKtangle platforms!

General Description:

The UEISIM offers Simulink users a powerful and flexible I/O target. Models built in Simulink are deployed directly on the UEISIM using Real-Time Workshop. The combination creates a powerful solution for creating and tuning real-time (and non-real-time) applications including simulation model verification, rapid prototyping, and hardware-in-the-loop testing. The UEISIM is rugged, flexible, and expandable enough not only to be a great solution while in your development cycle, but also the ideal solution for your production hardware.
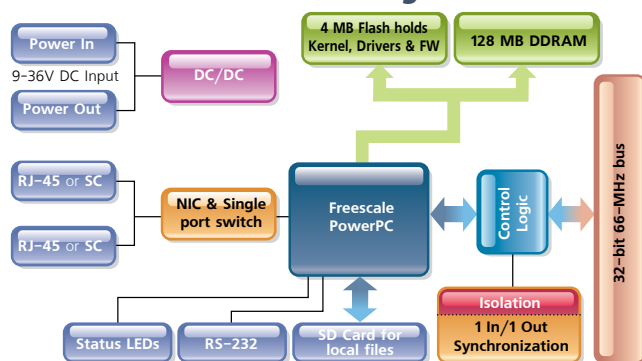
To use the UEISIM, simply: a.) Build your Simulink application. b.) Open MATLAB and select Simulink/Embedded target for UEISIM. c.) Convert your model to use the UEISIM I/O blocks (if you had not used them in your original model). d.) Create an executable via Simulink Coder (formerly RTW). e.) Connect the UEISIM in "external mode" (if you wish to remotely monitor the application while running on the UEISIM). f.) Start your simulation. Six easy steps and your simulation is running live on real hardware.

The UEISIM 300 is 4 × 4.1 × 4 and offers 3 I/O slots. The UEISIM 600 is slightly larger at 4 × 4.1 × 5.8 but provides 6 I/O slots and allows up to 150 analog inputs or 288 DIO channels, or 96 serial I/O channels. GigE versions of the UEISIM Cubes are designated as the UEISIM 300-1G and UEISIM 600-1G. The RACKtangle-based UEISIM 1200R and UEISIM 600R offer 12 and 6 slots respectively in a front-loading rack configuration. The UEISIM uses the same I/O boards as our popular PowerDNA family and includes analog input (with up to 24 bit resolution), analog output (up to 32 channels PER BOARD), digital I/O, Serial and CAN communications, ARINC-429 networking, counter/timer, quadrature encoder input and more. With over 40 different I/O boards available, there is sure to be a configuration perfect for your application.

The heart of every UEISIM is a PowerPC processor running a standard (2.6.x) Linux OS kernel. Flash memory contains the OS Kernel and drivers for each of the I/O boards. The CPU/NIC also provides an SD Card slot, Ethernet interface (including a single port switch), Intercube trigger/sync interface, RS-232 serial port, power supply inputs and a variety of annunciator LEDs. The file system is contained on the SD card. It includes the other components of the operating system such as libraries, utilities, init script and daemons.

The UEISIM is rugged and robust. With 100Base-T Cubes tested from -40 °C to +85 °C, at 50 *g* shock, 5 *g* vibration and altitudes up to 70,000 feet (special version to 120,000 feet) and GigE-based chassis tested from -40 °C to +70 °C and 3 *g* vibration, the UEIPAC is tough enough for the most challenging applications. All I/O is

UEISIM Hardware Block Diagram:

General Description: (continued)

fully isolated from the controller, so the UEISIM is immune to the glitches and spikes so commonly seen in an industrial environment.

The UEISIM cubes offer a wide variety of mounting options. A flange kit allows the Cubes to be mounted to a wall or other flat surface. Rack kits and DIN Rail kits are available to allow mounting in 19" racks or on DIN rails respectively. UEISIM RACKtangles include flexible mounting ears that allow the RF or portable applications, there is even an attaché style carrying case that will safely hold a cube, its power supply, cables and screw terminal panels.

RACKtangle-based UEISIMs include rubber feet for desk-top use as well as mounting brackets that allow the RACKtangle directly into 19 inch racks. The brackets may be mounted on the rear of the RACKtangle allowing the chassis to be mounted on any flat surface or bulkhead.

Whether your application requires a few I/O channels or a few thousand, the UEISIM is an ideal solution. The Cube's unique combination of clean and simple Simulink/RTW target compatible Linux operating system, I/O flexibility, compact size, mechanical and electrical ruggedness, and ease of use are unparalleled.
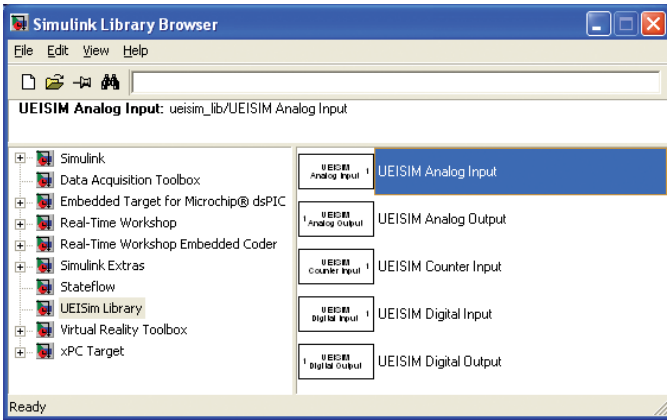
The UEISIM I/O blocks provided are both powerful and easy to use.
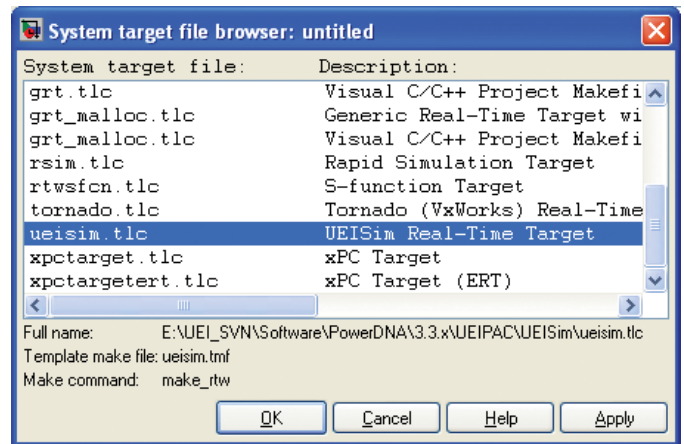
The UEISIM appears as a standard Real-Time-Workshop target.

Ordering Guide:

UEISIM Chassis (includes installed Linux OS, Universal AC power supply, Serial and Ethernet cables and 8 Gbyte SD Card)	
Part Number	**Description**
UEINET-SIM	Linux-based, Simulink/RTW I/O target with 1 available I/O slot
UEISIM 300	Linux-based, Simulink/RTW I/O target with 3 available I/O slots
UEISIM 600	Linux-based, Simulink/RTW I/O target with 6 available I/O slot
UEISIM 300-1G	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target with 3 available I/O slots
UEISIM 400F-AC	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, 110-240 VAC powered, 1U FlatRACK with 4 I/O slotss
UEISIM 400F-DC	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, 9-36 VDC powered, 1U FlatRACK with 4 I/O slots
UEISIM 400-MIL	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, DNA-MIL based cube with 4 available I/O slots
UEISIM 600-1G	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target with 6 available I/O slots
UEISIM 600R	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, RACKtangle with 6 available I/O slots
UEISIM 1200-MIL	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, DNR-MIL based RACK with 12 available I/O slots
UEISIM 1200R	Gigabit Ethernet, Linux-based, Simulink/RTW I/O target, RACKtangle with 12 available I/O slots
DNA-SD8GB	8 GByte SD card (one included with each UEISIM)
DNA-SD32GB	32 GByte SD card

UEISIM: Technical Specifications

Computer Interface	PPCx series Cubes	PPCx-1G series GigE Cubes	RACKtangle Chassis
Primary Ethernet Port	10/100Base-T, RJ-45 connector	10/100/1000Base-T, RJ-45 connector	10/100/1000Base-T, RJ-45 connector
Diagnostic Port	not applicable	10/100/1000Base-T, RJ-45 connector	10/100/1000Base-T, RJ-45 connector
Daisy chain output	10/100Base-T, RJ-45 connector	n/a	n/a
Optional Interface	100Base-FX Fiber (single or multi mode)	n/a	n/a
Config/Serial Port	RS-232, 9-pin "D"	RS-232, 9-pin "D"	RS-232, 9-pin "D"
USB Port	not supported	USB 2.0 fully supported	USB 2.0 fully supported
Sync	DNA-SYNC series cables and boards provide system clock or trigger synchronization	DNA-SYNC-1G series cables and boards provide both clock and trigger sync signals	DNA-SYNC-1G series cables and boards provide both clock and trigger sync signals
I/O Board Support			
Series supported	All DNA-series boards	All DNA-series boards	All DNR-series boards
Software Requirements			
MATLAB	Version 2007b or greater	Version 2007b or greater	Version 2007b or greater
Simulink	Version 7.0 or greater	Version 7.0 or greater	Version 7.0 or greater
Real-Time Workshop	Version 7.0 or greater	Version 7.0 or greater	Version 7.0 or greater
Software / Operating System			
Embedded OS	Linux, kernel 3.4.x	Linux, kernel 3.4.x, Xenomai RTOS support	Linux, kernel 3.4.x, Xenomai RTOS support
Dev Language	C	C	C
Dev Environments	Simulink / RTW with Cygwin environment on a Windows PC	Simulink / RTW with Cygwin environment on a Windows PC	Simulink / RTW with Cygwin environment on a Windows PC
Processor/system			
CPU	Freescale MPC5200, 400 MHz, 32-bit	Freescale 8347, 400 MHz, 32-bit	Freescale 8347, 400 MHz, 32-bit
Memory	128 MB (64 MB available for application SW)	128 MB (64 MB available for application SW)	128 MB (64 MB available for application SW)
SD card interface	SD cards up to 32 GB (8 GB included)	SD cards up to 32 GB (8 GB included)	SD cards up to 32 GB (8 GB included)
USB drive interface	n/a	Standard USB 2.0 port	Standard USB 2.0 port
Physical Dimensions			
3 I/O slots	UEIPAC 300: 4.1" x 4.0" x 4.0"	UEIPAC 300-1G: 4.1" x 5.0" x 4.0"	n/a
6 I/O slots	UEIPAC 600: 4.1" x 4" x 5.8"	UEIPAC 600-1G: 4.1" x 5.0" x 5.8"	UEIPAC 600R: 5.25" x 6.2" x 10.5"
12 I/O slots	n/a	n/a	UEIPAC 1200R: 5.25" x 6.2" x 17.5" (Std 3U)
Environmental			
Electrical Isolation	350 Vrms	350 Vrms	350 Vrms
Temp (operating)	-40 °C to 85 °C	-40 °C to 70 °C	-40 °C to 70 °C
Temp (storage)	-40 °C to 100 °C	-40 °C to 100 °C	-40 °C to 100 °C
Humidity	0 to 95%, non-condensing	0 to 95%, non-condensing	0 to 95%, non-condensing
Vibration			
(IEC 60068-2-64)	10–500 Hz, 5 g (rms), Broad-band random	10–500 Hz, 3 g (rms), Broad-band random	10–500 Hz, 3 g (rms), Broad-band random
(IEC 60068-2-6)	10–500 Hz, 5 g, Sinusoidal	10–500 Hz, 3 g, Sinusoidal	10–500 Hz, 3 g, Sinusoidal
Shock			
(IEC 60068-2-27)	50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations	50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations	50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations
Altitude	70,000 feet, (special version to 120,000')	16,000 feet, maximum	16,000 feet, maximum
Power Requirements			
Voltage	9 - 36 VDC (115/220 VAC adaptor included)	9 - 36 VDC (115/220 VAC adaptor included)	9 - 36 VDC (115/220 VAC adaptor included)
Power	3.5 Watts (not including I/O boards)	7 Watts (not including I/O boards)	10 Watts (not including I/O boards)
Reliability			
MTBF	>300,000 hours	>160,000 hours	>130,000 / 160,000 hrs DNR-12 / DNR-6