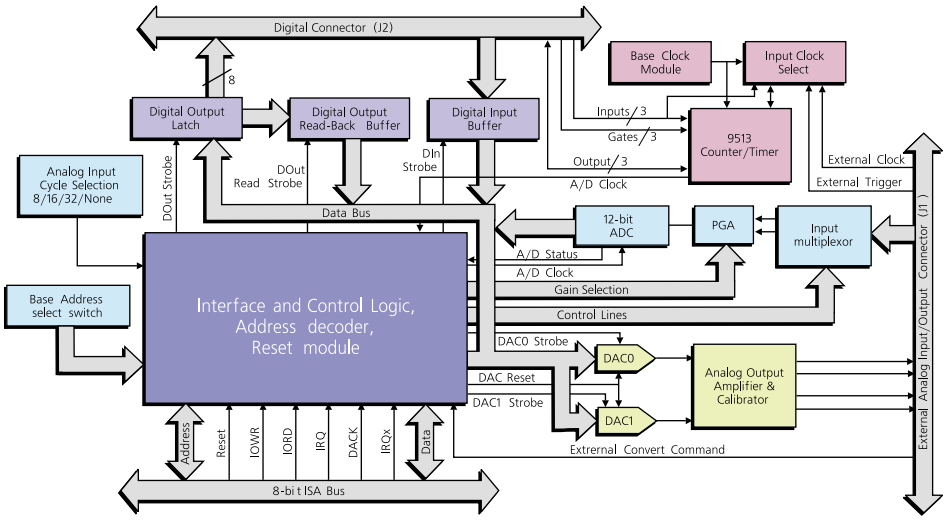
Features

- Drop-in replacement for Analog Devices RTI-800/815
- 32 single-ended/16 pseudo-differential A/D inputs
- 12-bit resolution
- 100 kS/s sampling rate
- Programmable gain: 1, 10, 100, 500
- Two 12-bit, 200 kHz D/As (UEI-815 only)
- 8 digital inputs and 8 digital outputs
- Three 16-bit user-dedicated counter/timers
- Simultaneous A/D, D/A, DIO, counter/timer subsystem operation
- External clocking and triggering for A/D

General Description

The UEI-815 is a multifunction board that plugs into an ISA slot (the UEI-800 is a version with no analog outputs). It features capabilities for analog I/O, digital I/O and counter/timer functions. The UEI-815 supports the measurement of 32 single-ended input signals, 32 pseudo-differential inputs or 16 differential inputs. Also it contains a software-selectable instrumentation amplifier that conditions low-level analog input signals with gain settings of 1, 10, 100 or 500. In addition to the analog input channels, the UEI-815 board contains two analog outputs. Each output channel has its own 12-bit digital-to-analog converter.

The UEI-815 provides 8-channel parallel digital input port and an 8-channel parallel digital output port. Both ports are TTL-compatible. The logic of the digital output channels is inverted for compatibility with solid-state relay I/O subsystems, which you can connect to the board. The optional Intel 82C54 or AMD 9513 counter/timer chips provide three or five independent 16-bit counter/timer channels for time-related digital I/O applications.



UEI-800/815 Block Diagram

+5V	1	2	NC
DIO0	3	4	DIN0
DIO1	5	6	DIN1
DIO2	7	8	DIN2
DIO3	9	10	DIN3
DIO4	11	12	DIN4
DIO5	13	14	DIN5
DIO6	15	16	DIN6
DIO7	17	18	DIN7
DGND	19	20	DGND
CTR0-IN	21	22	CTR2-IN
CTR0-GATE	23	24	CTR2-GATE
CTR0-OUT	25	26	CTR2-OUT
CTR1-IN	27	28	CTRFREQ-OUT
CTR1-GATE	29	30	DGND
CTR1-OUT	31	32	DGND
DGND	33	34	DGND

UEI-815 J1 Connector

AGND	1	2	AGND
AIN0	3	4	AIN16
AIN1	5	6	AIN17
AIN2	7	8	AIN18
AIN3	9	10	AIN19
AIN4	11	12	AIN20
AIN5	13	14	AIN21
AIN6	15	16	AIN22
AIN7	17	18	AIN23
AIN8	19	20	AIN24
AIN9	21	22	AIN25
AIN10	23	24	AIN26
AIN11	25	26	AIN27
AIN12	27	28	AIN28
AIN13	29	30	AIN29
AIN14	31	32	AIN30
AIN15	33	34	AIN31
AIN SENSE	35	36	AGND
AGND	37	38	AGND
AOUT0	39	40	AOUT1
AOUT0 SENSE	41	42	AOUT1 SENSE
AGND	43	44	AGND
DGND	45	46	DGND
External Convert Command	47	48	External Trigger
External Clock	49	50	DGND

UEI-815 J2 Connector

Technical Specifications

Analog Inputs

Resolution	12 bits
Number of Channels	
Single-Ended	16 or 32
Differential	8 or 16
Pseudo-differential	16 or 32
Maximum Sampling Rate	100 kS/s
Type of A/D	Successive approximation
Input Ranges	0–10V, ±5V, ±10V (jumper selectable)
Programmable Gains	1, 10, 100, 500 (software selectable)
Drift	
Zero	±30 µV/°C
Gain	±30 ppm/°C
Input Impedance	100 MΩ in parallel with 22 pF
Input Bias Current	±20 nA
Input Overvoltage	±40V powered or unpowered
A/D Conversion Time	8 µs
A/D Settling Time	7 µs
DC Accuracy	
Nonlinearity	±0.5 LSB (no missing codes)
System Noise	0.5 LSB
AC Accuracy	
Effective Number of Bits	11.6
Total Harmonic Distortion+ Nonlinearity+Noise	72 dB
Channel Crosstalk	-80 dB @ 1 kS/s
Clocking and Trigger Input	
Maximum A/D Pacer Clock	
Aggregate Throughput	100 kS/s @ 0.001% accuracy
External A/D Sample Clock	
Maximum Frequency	100 kS/s
Minimum Pulse Width	100 ns
External Digital (TTL)Trigger	
High-level Input Voltage	2.0V min
Low-level Input Voltage	0.8V min
Minimum Pulse Width	100 ns

General

Dimensions	4.8 x 4.2" (12 x 10.6 cm)
Operating Temperature Range	0 to 70°C
Storage Temperature Range	-25 to +85°C
Relative Humidity	Up to 90% (non-condensing)
Power Consumption	5V dc @ 0.5A 1 MΩ load @ all outputs

Analog Outputs (UEI-815 only)

Number of Channels	2
Resolution	12 bits
Update Rate	200 kS/s each
Analog Output Range	0–10V, ±10V (jumper selectable)
Error Gain	±0.5 LSB
Error Zero	Calibrated to 0
Current Output	±18 mA min
Output Impedance	0.3Ω typ
Capacitive Drive Capability	1000 pF
Nonlinearity	±1 LSB
Protection	Short circuit to analog ground
Power-on Code	0h000
Setting Time to 0.01% of FSR	10 µs, 20V step 1 µs, 100-mV step
Slew Rate	30 V/µs

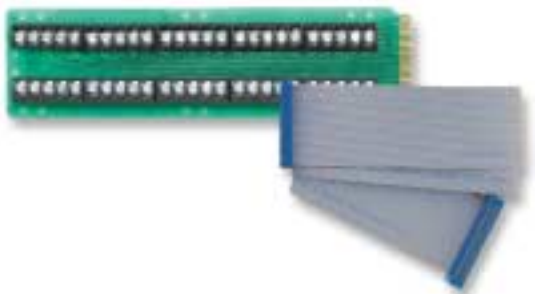
Digital I/O

Input Bits	8 (with on-board pullup resistors)
Output Bits	8 inverted
Inputs	
High-level Input Voltage	2.0V min
Low-level Input Voltage	0.8V max
High-level Input Current	20 µA
Low-level Input Current	-20 µA
Outputs	
Output Driver High Voltage	2.5V min, 3.0V typ (I_{OH} = -12 mA)
Output Driver Low Voltage:	0.55V max (I_{OL} = 12 mA)
Current Sink	-12/12 mA max
Power-on Voltage	Logic Zero
Readback for Output	8 bits

Counter/Timers (optional)

Number of Counters	3 available to user
Resolution	16 bits on each counter
Clock Inputs	
(jumper configurable)	Internal: 1 MHz, 5 MHz External: ≤ 10 MHz
High-level Input voltage	2.0V min
Low-level Input voltage	0.8V max
High-level Input current	100 µA
Low-level Input current	100 µA
Gate Inputs	
Maximum Pulse Width	100 ns (High), 100 ns (Low)
Counter Outputs	
Output Driver High Voltage	2.5V min (I_{OH} = 24 mA)
Output Driver Low Voltage	0.55V max (I_{OH} = 48 mA)

Accessories for UEI-800/815 Boards



UEI–AC1585–1

UEI-AC1585-1 kit

The UEI-AC1585-1 is a 50-position screw-terminal panel with 3-ft (0.9m) cable for easy connection to any UEI-800/815 board. This is a direct replacement for the Analog Devices AC1585-1.

UEI–IOB–120–01

UEI-IOB-120-01 kit

The UEI-IOB-120-01 is an interface board with three connectors and analog-output screw terminals (two channels). It includes a 3-ft (0.9m) 50-way ribbon cable with 50-/50-pin connectors and two 3-ft (0.9m) 26-way ribbon cables with 26-/26-pin connectors. This is a direct replacement for the Analog Devices IOB-120-01.

Ordering Information

UEI-800	16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-800-32	32SE/16DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-800-A	16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-800-A-32	32SE/16DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-800-F	16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-800-F-32	32SE/16DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O
UEI-815	16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
UEI-815-32	32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
UEI-815-A	16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
UEI-815-A-32	32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
UEI-815-F	16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
UEI-815-F-32	32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O
Accessories	
UEI-AC-1585-1	Complete kit: analog input/output screw-terminal panel. Includes 3 ft 50-way ribbon cable
UEI-IOB-120-01	Complete kit: signal-conditioning interface panel. Includes one 50-way and two 26-way ribbon cables
PD-SCXU-AOMUX	8-channel analog-output multiplexer (replacement for ADI STB-AOT)