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.
## 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+: 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 max
  - 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
- **Slew Rate**: 30 V/µs

### Digital I/O

- **Input Bits**: 8 (with on-board pullup resistors)
- **Input 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_{OL} = 48 mA)
## UEI-800/815 ISA Multifunction Boards

### Accessories for UEI-800/815 Boards

#### 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 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

<table>
<thead>
<tr>
<th>UEI-800</th>
<th>16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>UEI-800-32</td>
<td>32SE/16DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O</td>
</tr>
<tr>
<td>UEI-800-A</td>
<td>16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O</td>
</tr>
<tr>
<td>UEI-800-A-32</td>
<td>32SE/16DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O</td>
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<tr>
<td>UEI-800-F</td>
<td>16SE/8DI A/D, gains: 1, 10, 100, 500, 3 counter/timers, 16 digital I/O</td>
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<tr>
<td>UEI-815</td>
<td>16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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<td>UEI-815-32</td>
<td>32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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<tr>
<td>UEI-815-A</td>
<td>16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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<tr>
<td>UEI-815-A-32</td>
<td>32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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<tr>
<td>UEI-815-F</td>
<td>16SE/8DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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<td>32SE/16DI A/D, gains: 1, 10, 100, 500, two 12-bit D/A, 3 counter/timers, 16 digital I/O</td>
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#### Accessories

- **UEI-AC1585-1**
  - 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)