The high-precision, completely isolated 16 bit analog output board

Do you consider high reliability, high noise immunity and high precision as very important for your application? Then this unique analog output board is a good solution for you. With its complete opt-isolation of all channels it is suitable for industry and lab. The board has high precision 16 bit D/A converters and some sophisticated extras...

- 4, 8, PCI also 16 voltage outputs. Range ±10 V (max. ±15 mA per channel). ME-6200 and ME-6300: 1 additional channel with 0...50 V.
- All channels with galvanic isolation, available as:
  - "p"/"island" channels: Full isolation with separate GNDs. All channels individually isolated from PC and from each other.
  - Isolated outputs with common ground/CGND.
- Individual high-precision 16 bit D/A converter per channel. Transparent output. Highspeed rates up to 500 kHz per channel, independent from system for channels with FIFO.
- Automatic adjustment, no potentiometers.
- Waveform generator - ME-6100/ME-6300: 8 kByte FIFO per channel on channels 1...4 for advanced operating modes (generation of waveforms/signals):
  - Continuous output.
  - WrapAround, periodic output under timer control of data sets from the FIFO. Output of periodic signals up to 250 kHz (square signal).
- 16 TTL digital I/O channels, grouped in 2x 8 bit ports. Each port programmable as inputs/outputs.
- Plug’n’Play. Available for the bus platforms StandardPCI and PXI/CompactPCI (PCI Local Bus 2.1 compatible) and with ME-Synapse: Ethernet/LAN, USB.

[Software included on CD:]
- ME-iDS and ME-iDC driver and configuration tool for Windows XP, 2000, Vista and GNU Linux 2.6.
- Supports Visual C/C++, Visual Basic, VEE Pro (Windows), LabVIEW (Windows, Linux), Python.
- "Soft manuals" English and German for Acrobat Reader/PDF.

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### Analog standard outputs

<table>
<thead>
<tr>
<th>Number</th>
<th>4 or 8 voltage outputs, PCI versions also with 16 voltage outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current</td>
<td>Without external supply, depending on number of channels: ( I_{\text{nom}} ) per channel ±3...15 mA. &quot;p&quot;/&quot;island&quot; channels, with external supply ( \pm 15 \text{ V} ) ± 15 mA (external supply always required)</td>
</tr>
<tr>
<td>Output range</td>
<td>( \pm 10 \text{ V} )</td>
</tr>
<tr>
<td>Accuracy</td>
<td>(Full scale) ( \gamma ) isolated max. ( 0.191 % ), min. ( 0.095 % ). &quot;p&quot;/&quot;island&quot; max. ( 0.129 % ), min. ( 0.03 % )</td>
</tr>
<tr>
<td>Isolation</td>
<td>Versions &quot;i&quot;/&quot;p&quot;/&quot;island&quot;: Full galvanic isolation with separate grounds/no common ground. Max. 500 V isolation from PC, max. 250 V between the &quot;islands&quot;</td>
</tr>
</tbody>
</table>

**D/A converter**
- 1 serial high-precision converter per channel. 16 bit./max. 500 kHz (see "information on A/D and D/A rates")

**Setting time**
- Max. 2 µs \( (10 \text{ V} \rightarrow +10 \text{ V}) \)

**Operating modes**
- ME-6100/ME-6300 for channels 1 to 4: Continuous mode (continuous output under timer control) and WrapAround mode (periodic output under timer control). D/A timer from 2 µs to 130 s in steps of 30.30 ns programmable
- FIFOs
  - ME-6100/6300, channel 1...4: 8 k Byte D/A FIFOs per channel

**External trigger**
- ME-6100/6300, channel 1...4: TTL level (typ. 5 V), rising/falling/both, for start of conversion (WrapAround, Continuous)

### Analog high voltage outputs on models ME-6200 and ME-6300 [PXI/CompactPCI only]

<table>
<thead>
<tr>
<th>Number</th>
<th>1 voltage output (channel 5 or channel 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output range</td>
<td>( 0 \rightarrow +50 \text{ V} )</td>
</tr>
<tr>
<td>Output current</td>
<td>Max. 20 mA</td>
</tr>
<tr>
<td>Isolation</td>
<td>Versions &quot;i&quot;/&quot;p&quot;/&quot;island&quot;: Full galvanic isolation with separate grounds/no common ground. Max. 500 V isolation from PC, max. 250 V between the &quot;islands&quot;</td>
</tr>
</tbody>
</table>

**D/A converter**
- 1 serial high-precision converter: 16 bit./max. 500 kHz

**Setting time**
- Max. 25 µs at full scale \( (0 \rightarrow +50 \text{ V}) \)

**Operating modes**
- Output of single value (transparent)

### Digital I/O (TTL)

| Number, type | 2x 8 bit ports of I/O channels, each port programmable as inputs/outputs. Output \( U_{\text{on}} \) max. 0.5 V at 24 mA, \( U_{\text{on}} \) max. 24 V at -24 mA. Input \( U_{\text{in}} \) max. 0.8 V at \( V_{\text{CC}}=5 \text{ V} \), \( U_{\text{in}} \) min. 2 V at \( V_{\text{CC}}=5 \text{ V} \), input current \( \pm 1 \mu \text{A} \) |

**General**
- Bus interface
  - StandardPCI or CompactPCI/PCI, 32 bit/33 MHz 5 V PCI Local Bus 2.1 compatible
- Size (mm)
  - StandardPCI: 174 x 98 (without slot bracket/connector); CompactPCI/PCI: 180 x 100 (3 HE Europacard)
- Connectors
  - 78-pin D-sub female; a flat ribbon cable with 25-pin D-sub female and slot bracket (ME AK-D25F/S) is included; uses a second slot of the PC
- Power consumption
  - (at \( +5 \text{ V} \), 16 D/A channels, no external load) "i" max. 3.8 A, "p"/"island" max. 1.2 A
- Certificates
  - CE certification, EG standards 89/336/EMC, emission EN 55022, noise immunity EN 50082-2

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Ready for ME-Synapse, that means: You can use the CompactPCI versions of the ME-6x00 with the ME-Synapse LAN in your ethernet or with the ME-Synapse USB at the USB! For more information see the ME-Synapse.
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--- Ordering codes and features

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Code</th>
<th>Channels</th>
<th>Ranges</th>
<th>Galvanic isolation</th>
<th>FIFO</th>
<th>Digital I/O</th>
<th>Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME-6000</td>
<td>ME-6000/4 PCI</td>
<td>4</td>
<td>±10 V</td>
<td>With common ground/CGND</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6000</td>
<td>ME-6000/4 cPCI</td>
<td>4</td>
<td>±10 V</td>
<td>With common ground/CGND</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6000</td>
<td>ME-6000/8 PCI</td>
<td>8</td>
<td>±10 V</td>
<td>With common ground/CGND</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6000</td>
<td>ME-6000i/4 PCI</td>
<td>4</td>
<td>±10 V</td>
<td>Complete isolation/separate GNDs</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6000</td>
<td>ME-6000p/4 PCI</td>
<td>8</td>
<td>±10 V</td>
<td>Complete isolation/separate GNDs</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6000</td>
<td>ME-6000/16 PCI</td>
<td>16</td>
<td>±10 V</td>
<td>Complete isolation/separate GNDs</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6100</td>
<td>ME-6100/4 PCI</td>
<td>4</td>
<td>±10 V</td>
<td>With common ground/CGND Ch. 1 - 4</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6100</td>
<td>ME-6100/4 cPCI</td>
<td>4</td>
<td>±10 V</td>
<td>Complete isolation/separate GNDs Ch. 1 - 4</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
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<tr>
<td>ME-6100</td>
<td>ME-6100/8 PCI</td>
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<td>±10 V</td>
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<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6100</td>
<td>ME-6100/16 PCI</td>
<td>16</td>
<td>±10 V</td>
<td>Complete isolation/separate GNDs Ch. 1 - 4</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6200</td>
<td>ME-6200/5 PCI</td>
<td>5</td>
<td>±10/50 V</td>
<td>With common ground/CGND</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6200</td>
<td>ME-6200/5 cPCI</td>
<td>5</td>
<td>±10/50 V</td>
<td>Complete isolation/separate GNDs</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6200</td>
<td>ME-6200/9 PCI</td>
<td>9</td>
<td>±10/50 V</td>
<td>With common ground/CGND</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6200</td>
<td>ME-6200/9 cPCI</td>
<td>9</td>
<td>±10/50 V</td>
<td>Complete isolation/separate GNDs</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6300</td>
<td>ME-6300/5 PCI</td>
<td>5</td>
<td>±10/50 V</td>
<td>With common ground/CGND Ch. 1 - 4</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
<tr>
<td>ME-6300</td>
<td>ME-6300/5 cPCI</td>
<td>5</td>
<td>±10/50 V</td>
<td>Complete isolation/separate GNDs Ch. 1 - 4</td>
<td>-</td>
<td>-</td>
<td>PCI</td>
</tr>
</tbody>
</table>

Scope of delivery
Board, ME-Power-CD, ME AK-D78/6000M-01, ME AK-D25F/S, 25-pin mating plug

Attractive bundles:
Buy the ME board of your choice bundled with accessory of your choice and save money! For example:

- **ME-SK ME-6x00** StartKit with: ME-6x00 of your choice + cable of your choice + terminal block of your choice.
- **ME-PP ME-6x00** PowerPack with: ME-6x00 of your choice + cable of your choice + terminal block of your choice + graphic software development environment VEE Pro in current full version.

Examples - bundles with ME-6x00 and ME-Synapse or ME-Neuron

- **ME-Synapse USB 6100i/4** USB signal generator station: ME-Synapse USB + ME-6100i/4.
- **ME-Synapse LAN PWR** Power supply for ME-Neuron and ME-Synapse LAN, with Phoenix terminals, DIN rail mountable.

1) ME-6200 and ME-6300: Option “E” for external supply or option “I” for internal supply/from PC.
2) ME-6200 and ME-6300: Channels 1 - 4 or 1 - 8 are standard voltage outputs ±10 V. Channel 5 or channel 9 are high voltage outputs 0…+50 V.
3) The max. rates of channels without FIFOs are depending on the system when used in an ME-Synapse USB.

- Light green: Standard models, short delivery times. All other models: Special custom versions on request.
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### ME-6x00

**ME-6x00 + cable/terminal blocks**

- **ME AK-D78 / 6000MOE/1** (included)
- **ME AB-D78M / 6000 (H) or ME AB-D78M / S (H)**
- **ME D25** (included)
- **ME AB-D25M**

**ME-6x00 + ME-UB or ME-63Xtend**

- **ME AK-D25F / S** (included with board)
- **ME AB-D78M / 6000**
- **ME-63Xtend series**
- **ME-6x00 cPCI + ME-6 cPCI**

### Analog outputs

- **ME-6x00 cPCI + ME-6 cPCI**
- **ME-6 Power supply board for the “island” channels of the ME-6x00 series boards.**
- **ME-5 1-channel power amplifier for the analog outputs of the ME-6x00 series boards.**
- **ME-Synapse LAN and USB Adaptor from 3 U ME CompactPCI to USB or Ethernet/LAN.**
- **ME-NeuronPre-configured, 3 U CompactPCI-based complete DAQ and control system.**

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**Recommended accessory for the ME-6x00...**

For applications with high precision and optimum noise immunity:

- **ME AK-D78 / HQ / x**
  - **x = 0.5 m, 1 m or 2 m high quality cable.**
  - **78-pin D-sub male to female, 1:1 contacted. Metal housing and 2 lines of cable.**
  - **ME D25 / 2**
  - **2 m standard cable.**
  - **25-pin D-sub male to female, 1:1 contacted. Standard cable.**
  - **ME-D78M / 6000**
  - **ME-D78M / 6000H**

**Alternative:**

- **ME D25 / 1**
- **1 m high quality cable. 25-pin D-sub male to female, 1:1 contacted. Metal housing.**

**Deluxe terminal block.**

- **ME-D2515 / 4000**
  - **1 m cable.**
  - **25-pin D-sub male to 2 x 15-pin D-sub male, use to connect 2 x ME-UB.**
- **ME-D78M / 6000M**
  - **ME-D78M / 6000MOE / 1**
  - **ME-D78M / 6000M**
  - **ME-D78M / 6000MOE / 1**

**In cases you don't want to use a terminal block:**

- **ME-D2578 / 4000**
  - **1 m special cable for ME-6x00. 78-pin D-sub male and open ends.**
  - **With special multiple shielding. Only required as spare part, 1 x included with the board.**

**Expand the on-board digital ports:**

- **ME-D78M / 5H**
  - **Deluxe terminal block. 78-pin D-sub male to pluggable spring terminals as well as 25-pin D-sub male to spring terminals. In a robust metal box or in a DIN rail mountable card carrier (H).**
- **ME-D78M / 6000**
  - **ME-D78M / 6000H**

**Alternative:**

- **ME-D2515 / 4000**
  - **1 m cable.**
  - **25-pin D-sub male to 15-pin D-sub male, use to connect 2 x ME-UB.**
  - **ME-D78M / 6000**
  - **ME-D78M / 6000H**

**Further accessory:**

- **ME-D2515 / 4000**
  - **1 m cable.**
  - **25-pin D-sub male to 15-pin D-sub male, use to connect 2 x ME-UB.**
  - **ME-D78M / 6000**
  - **ME-D78M / 6000H**

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**ME-Neuron Pre-configured, 3 U CompactPCI-based complete DAQ and control system.**