

ACECT System Specification



1. Working environment

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|-------------|-----------------------|
| General | Laboratory conditions |
| Temperature | 0 ~ 50°C ambient |
| Humidity | Without condensation |
| Power | 110-240 V~ |

2. System hardware

Hardware units

| | | |
|-------------------------------|---|--|
| Capacitance measurement board | 8 | 2 measurement channels each board and 16 measurement channels in total |
| DDS signal generator board | 1 | Providing 2 programmable sinusoidal signals |
| Multiplexer | 1 | Compatible with Eurocase* |
| Backplane board | 1 | 96 channels |
| PCI data acquisition board | 1 | With ADC, DAC and DI/DO |
| Ribbon cable | 1 | 50 wires |
| Eurocase | 1 | 19" |

* Eurocase is a European standard for industrial and laboratory instrumentation

Hardware details

| | | |
|------------------------------------|--|--|
| Each capacitance measurement board | Number of measurement channel | 2 |
| | Capacitance measuring circuit | Sinusoidal excitation and phase-sensitive demodulation |
| | Excitation frequency | Programmable up to 500 kHz (Default frequency: 200 kHz) |
| | Adaptive capacitance measurement range | 0 ~ 2 pF (Different measurement range with different electrode pair/combination) |
| | Capacitance resolution | < 0.1 fF |
| | Signal-to-noise ratio (SNR) | > 60 dB |
| | Power supply | +5 V, ±15 V |
| | Board format: | Eurocard** |
| | Connector to electrode | SMB |
| Connector to backplane board | DIN41612 a/c-64 way plug | |
| DDS signal generator board | Number of generators | 2 |
| | Signal type | Sinusoidal |
| | Signal frequency | Programmable up to 500 kHz (Default frequency: 200 kHz) |
| | Signal amplitude | Programmable up to 20 V _{p-p} (Default amplitude: 16 V _{p-p}) |
| | Phase between 2 sinusoidal signals | 0 ~ 360° programmable |
| | Power supply | +5 V, ±15 V |
| | Board format | Eurocard |
| | Connector to backplane board | DIN41612 a/c-64 way plug |
| Multiplexer board | Number of input channels | 16 |
| | PGA gain | 1, 2, 4, 8, 16 |
| | Power supply | +5 V, ±15 V |
| | Board format | Eurocard |
| | Connector to backplane board | DIN41612 a/c-64 way plug |
| Backplane board | Board format | Compatible with Eurocase |
| | Connector | DIN41612 a/c-64 way socket |
| Data acquisition board | Number of channels of analogue input | 16 |
| | Resolution of ADC | 12 bits |
| | Number of analogue output | 2 |
| | Resolution of DAC | 12 bits |
| | Number of DI/DO | 24 |
| | Computer interface | PCI |
| Power supply | Data acquisition rate (without online display) | >100 frames per second for a 12-electrode sensor |
| | Input voltage range | 85-264 V~ |
| | Input frequency | 47 ~ 440 Hz |
| | Outputs | +5 V (3 A), +15 V (1.5 A) DC, -15 V DC (0.5 A) |
| | Max. power | 25 W |
| | CE marked | Yes |

| | | |
|--------------|-------------------------------|------------------------------|
| Ribbon cable | Number of wires | 50 |
| | Type of connector to PC | 50 pin D shape |
| | Type of connector to Eurocase | 50 pin ribbon |
| Eurocase | Type | 3U 84HP (19") desk enclosure |
| | Approximate size | 50×12×27 cm |
| | Weight with boards | 5.1 kg |

** Eurocard is a European standard and compatible with Eurocase

3. System software

Software package

| |
|--------------------------------|
| System test program |
| Image data acquisition program |
| Image reconstruction programs |
| Data conversion program |

Software details

| | | |
|--|---|-----------------------------------|
| Overall | Working environment | Windows XP |
| | Computer language for system software | Visual C++ |
| System test program | Test offset | |
| | Test DC gain | |
| | Test data acquisition of a single set of capacitance data | |
| Data acquisition program | System calibration | |
| | Combined excitation electrode | 1, 2 and 4*** |
| | Acquisition of defined sets of image data | |
| | Calculation of normalised capacitance | |
| Linear back-projection (LBP) algorithm | Save binary raw measurement data | |
| | Generic sensitivity maps provided for 8- and 12-electrode sensors | |
| | Linear back-projection algorithm | |
| | Image display | |
| Landweber iteration algorithm | Volume concentration estimation from normalised capacitance and image | |
| | Relaxation factor | Programmable (Default value: 1.2) |
| | Number of iterations | Programmable |
| Binary to text conversion software | Plus all other functions in LBP algorithm | |
| | Read binary raw measurement data | |
| | Save text measurement data | |

*** Sensitivity maps for 4-electrode combination are not provided

4. Optional (not included)

| | | |
|----------------------------|--|----------------------|
| Demonstration sensor | Number of electrode | 12 |
| | Cable | RG174 A/U |
| | Connector | SMB |
| | Diameter | 1.5" |
| | Length | 21" |
| | Weight | 1 kg |
| USB data acquisition board | Working with laptop | Instead of PCI board |
| | Number of channels of analogue input | 16 |
| | Resolution of ADC | 12 bits |
| | Number of analogue output | 2 |
| | Resolution of DAC | 12 bits |
| | Number of DI/DO | 8 |
| | Computer interface | PCMCIA |
| Data acquisition rate | 500 k sample/s**** | |
| Accessories | Cable | RG174 A/U |
| | Connector | SMB |
| | SMB plug cramp tool | |
| | Self-adhesive copper foil to construct sensor electrodes | |

**** The overall data acquisition rate with PCMCIA interface is lower than PCI interface.

Declaration: The above specification is accurate when this document is written. Some specification may change at the discretion of ECT Instruments Ltd.

If you are interested in this product, please contact us by
Tel. +44 161 962 7923, Email: info@ect-instruments.com or sales@ect-instruments.com