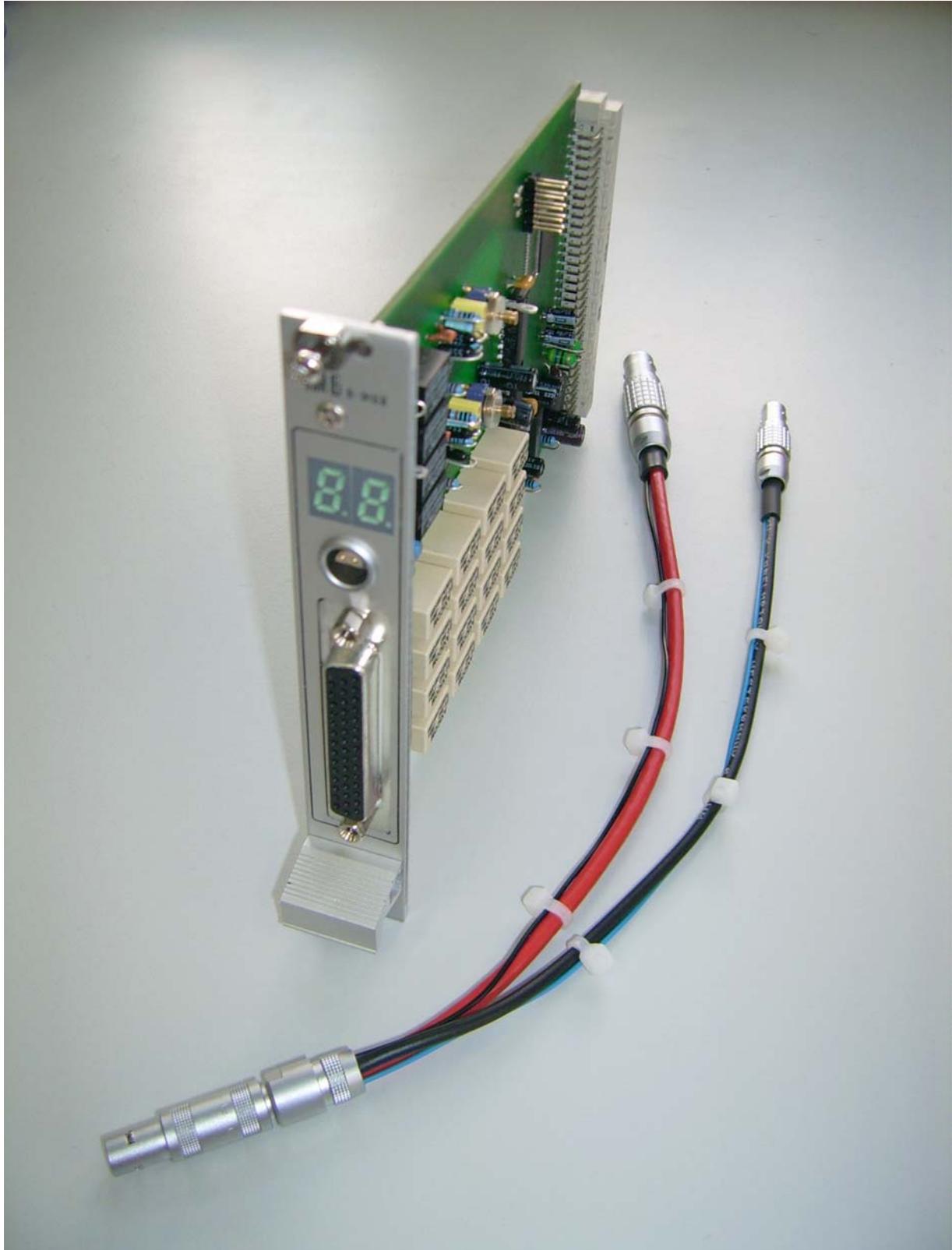


R M u x

16-channel extension



Introduction

RMux is a plug-and-play card for an extension slot of the IM6/6e/6ex. It allows to connect up to 16 electrochemical cells to the IM6/6e/6ex simultaneously. For measurement, a user-defined number of cells are measured (multiplexed) sequentially. Plugged into an empty extension slot it will be recognized automatically by the Thales software.

The counter electrode and the reference electrode outlets of the internal IM6/6e/6ex potentiostat are switched to the active cell only. The working electrode and the test electrode are connected internally and have a common outlet. The inactive cells are open circuit. A buffer amplifier (similar to the external U-buffer shipped with the IM6/6e/6ex) can be switched to the input by the Thales software.

Installation

For the installation of the RMux:

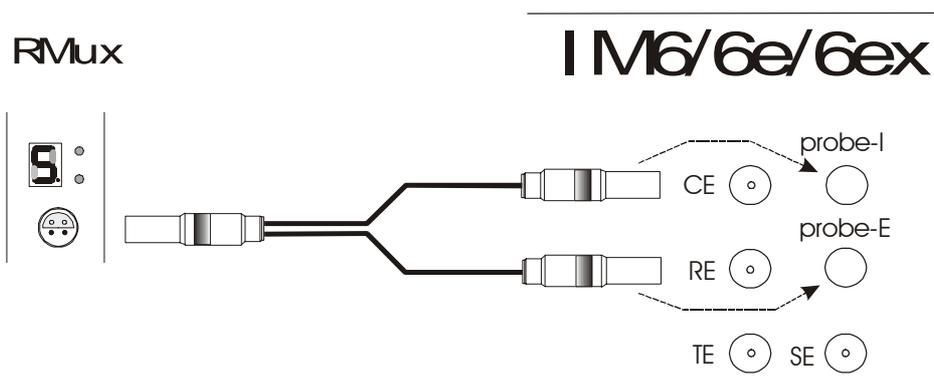
- Switch off the IM6/6e/6ex and disconnect it from mains
- Remove one of the empty slot front panels named *IM6 extension* by twisting the four screws at the top and the bottom
- Plug in the RMux card and fasten the two screws at the top and the bottom of its front panel
- Connect the IM6/6e/6ex to mains and switch it on

The hardware installation is finished now. The Thales software will detect the RMux card automatically when started.

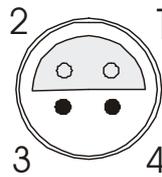
IM connections

Caution! Before connecting either the RMux to the IM6/6e/6ex or the cells to the RMux, **switch off the potentiostat!**

The RMux functions are controlled through the internal system bus, whereas the connections of the analogue signals have to be set up externally. For that purpose a Y-adapter cable is shipped with the RMux. The one-tailed-end connector is to be plugged into the RMux outlet, the two-tailed-end plugs go to the *probe-I* and *probe-E* plugs of the IM. The connectors do only fit to their corresponding outlet and therefore cannot be mixed up.



The pin assignment of the Lemos outlet on the RMux front panel is as follows:



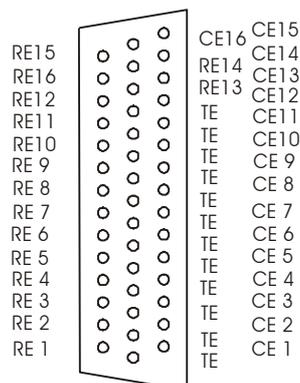
Type: Lemos ERA0S.304 CLL (front view)

- 1 = counter electrode
- 2 = test electrode power
- 3 = reference electrode
- 4 = test electrode sense

Cell connections

The RMux comes with a multi-lead cell cable which is connected to the 44-pin D-Sub outlet of the RMux. The multi-tail cable provides three leads for each of 16 cells. The colour coding is as follows:

- Black - test electrode
- Green - reference electrode
- Red - counter electrode



The lead-triplets are labelled with the corresponding channel number. For the connection of the cells, please only use the factory-made cable.

Caution ! If an RMux channel is used for measurement, please make sure that nothing is connected to the IM6/6e/6ex potentiostat outlets.

Front panel display

The RMux card provides a two-digit seven-segment front panel display and two indicator LEDs. They inform you of the active channel and the buffer settings.

The two red dots of the seven-segment displays indicate the gain factor of the RMux buffer amplifier:

left dot off + right dot on : gain = 1.0 => voltage range: +- 4 V, buffer on
left dot on + right dot on : gain = 0.4 => voltage range: +-10 V, buffer on
left dot off + right dot off : gain = 1.0 => voltage range: +- 4 V, buffer off

Software Control

After the installation Thales will detect the RMux card automatically during its start-up procedure. It will enable the selection of the RMux channels in all RMux compatible software sections.

Testsampling & Control Potentiostat

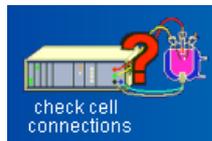
Main Menu -> EIS Menu -> Control Potentiostat

To select an RMux channel in the *Testsampling* page click on the *DEVICE* button:

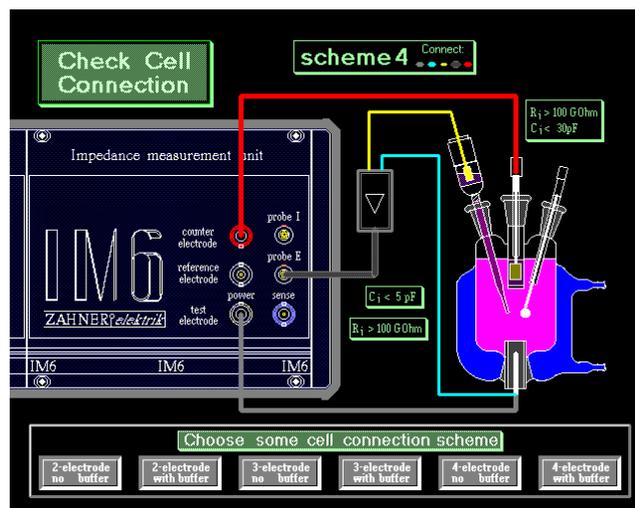


An input window will open which allows you to set the number of the active channel. "0" will select the IM6/6e/6ex potentiostat outlets, the numbers "1" to "16" will select the corresponding RMux channel. In order to define the buffer settings, go to the *Check Cell Connections* page

Main Menu -> EIS Menu -> Control Potentiostat -> Check Cell Connections



and do the settings as described in the IM manual. The setting will only affect the active channel. This means, you may set the buffer settings for each channel individually.



Select a connection scheme 1 through 4 (2- or 3-electrode measurement with or without buffer) and input the gain factor of 1.0 (voltage range $\pm 4 \text{ V}$) or 0.4 (voltage range $\pm 10 \text{ V}$). Do not mind the graphics of this page dealing only with the IM potentiostat outlets, even if an RMux channel is selected.

Series Measurements

To set up a series measurement which scans through a definable number of channels go to the *Define Series Measurement* page:

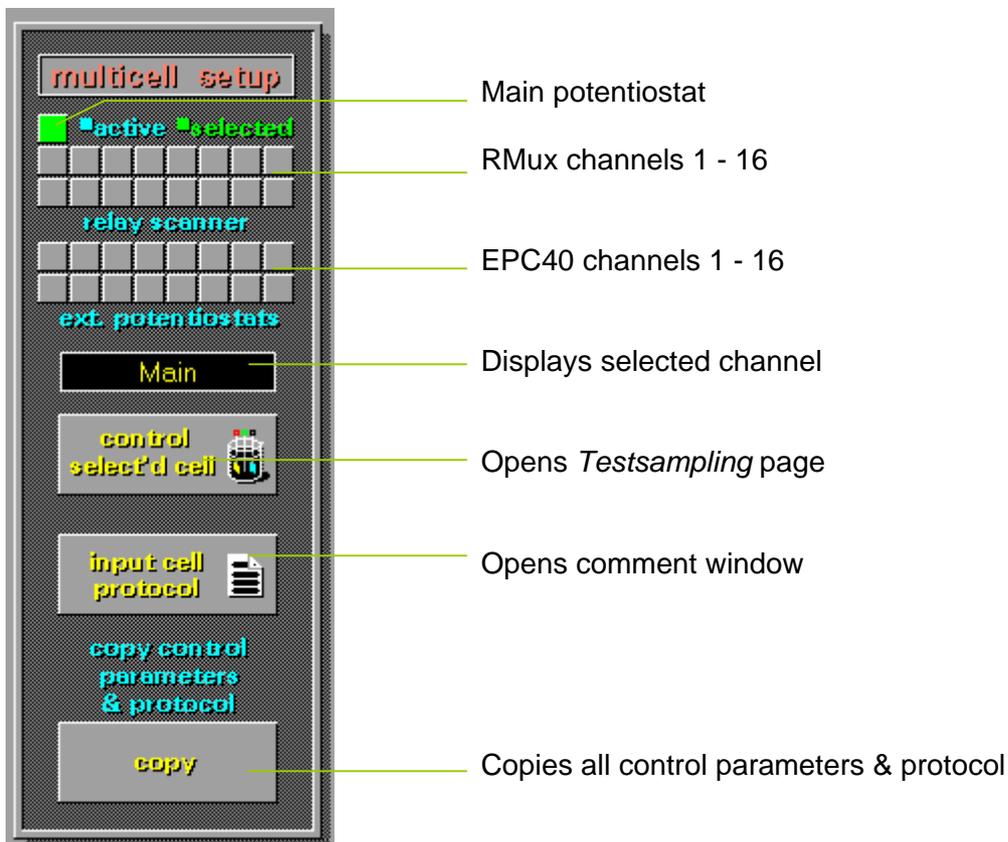
Main Menu -> EIS Menu -> Define Series Measurement



Select the option *Loop Multiple Cells*.



The right hand side of the window will show the *Multicell Setup*, then:



The squares on the top indicate the status of each channel:

grey -> inactive
blue -> active
green -> selected

The upper row shows the channels 1 to 8 (from left to right), the lower row shows the channels 9 to 16 (from left to right).

By clicking with the mouse on a square you cycle through the above mentioned states of a channel: inactive -> active -> selected -> inactive -> ...

The upper two rows are showing the RMux channels, the lower two rows show the channels of external potentiostats connected through EPC40 cards. The single square above the RMux rows represents the main potentiostat. You may select one of these by clicking on it.

The box below displays the name of the selected channel. Clicking on *Control Selec'd Cell* opens the *Testsampling* page. Here you may configure the selected channel as described in the chapter *Testsampling & Potentiostatic Control*. *Input Cell Protocol* opens a window where you may input your comments which will be saved along with the measurement data. The *Copy* button copies the cell parameters and the protocol entries of the selected channel to all active cells. This is useful if all channels must have the same parameters.