Protocol manager

BioWes

www.biowes.org

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Introduction

The purpose of this manual:

- Basic description of the software for local management of protocols and protocol templates
- Description of the process of protocol template designs
- Description of the process of protocol generation

Development team:

- Institute of complex systems, FFPW, University of South Bohemia in Ceske Budejovice
- dataPatner Ltd.
Outline:

• Protocol manager
  • Software GUI
  • Protocol templates
  • Protocols

• How to create and edit protocol template – Protocol designer
  • Components
  • Protocol design
  • Standardization

• How to create and edit protocol from template – Protocol generator
  • Plug-ins
  • Experimental data association
Protocol manager

- Protocol manager is a stand-alone application dedicated for the design of experimental protocol templates and management of experimental protocols.
- It is a part of BioWes solution. The software is operated at local computers (computers connected to measurement devices) connected to the local server.
- Contains two basic tools:
  - Protocol designer
  - Protocol generator
The role of Protocol manager in the system of experimental data management.
Protocol templates

- To manage protocol templates, click on Protocol templates on Home tab
- The list of user templates is listed (templates of the user or shared templates)

List of templates

- Not finalized template – can be modified
- Finalized template – cannot be modified
Protocols

- To manage protocols, click on Protocols on Home tab
- The list of user protocols is listed (protocols of the user or shared templates)

List of protocols

Finalized template – cannot be modified

Not finalized template – can be modified
How to create new protocol template – template designer

1. Click on Add on Protocol templates tab
   - Protocol designer tool is executed
2. Define the name of new protocol template
How to create new protocol template – template designer

- Protocol template designer is shown in the main window
- User can start to edit template by adding and modifying the components
- First and last tab are mandatory and can not be changed by user

Menu
Tab of template
List of components
Property of active component
Template window
How to edit protocol template – template designer

1. Click on Edit on Protocol templates tab
   • Protocol designer tool is executed
2. Double click on template in the list
   • Finalized templates cannot be modified
Design protocol template – template designer

- Protocol template designer allow the user to design new or modify existing protocol
- Protocol template should contain all the important information about setting of experiment:
  - Setting of devices
  - Initial conditions
  - Illustrative samples
  - Important steps of experiment
- The user should divide the template into logical part that corresponds to the different areas of the experiment
- The information in the template should allow to repeat or reproduce the experiment
The protocol is divided into four main parts

- Mandatory information (user can not change it – describes basic information for experiment identification) – can be changed by user
  - QR code
  - Name of experimentalist
  - Name of protocol
- Protocol – user defined components
- Information about the experimental data – can not be changed by user
Components

The designer is using 14 basic components for protocol definition:

- User input
  - Buttons
  - Number
  - Checkbox
  - Date/time
  - DropDown
  - Table
  - Text
  - Rich text

- Informative
  - Groupbox
  - Image
  - Label
  - QR code

- Links
  - Hyper link
  - Protocol link

The components are internally described by XML language.

Final protocol template is stored into XML file and can be open by any XML editor.
Design protocol template – template designer

- Template is designed draw-drop method using predefined controls.
- Drag the control from Protocol controls and drop it to template
Design protocol template – template designer

- Change the component property in property window
- Click on the property and select one possibility or insert text
- Confirm by enter
Design protocol template – template designer

- Size and position of component can be changed – left click and mouse move
- add tab – right click on active tab and select add
- delete component – right click on the component and select delete - all sub components will be deleted (groupbox)
Design protocol template – template designer

- **Common properties**
  - **Mandatory**
    - false – user need not to fill the component in protocol (information is not critical for reproducibility)
    - true – user has to fill the component in protocol
Components

- The designer is using 14 basic components for protocol definition
  - User input
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    - Number
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  - Links
    - Hyper link
    - Protocol link
- The components are internally described by XML language
- Final protocol template is stored into XML file and can be open by any XML editor
Design protocol template – components

Tab

- Divide protocol into logical parts

Properties:
- Name – tab name appears in the protocol

Change tab name in property window
GroupBox

- Encapsulate group of components

Properties:
- Name – groupbox name appears in the protocol
- New components are added into active groupbox

Change groupbox name in property window
Design protocol template – components

Rich text

• Component for formatted text input

![Image of Design protocol template](image_url)

- Properties:
  - Name – name of the component
  - Label position – left/top – defines position of name
  - External – name of the Plugin used for automatic filling of the component
  - ReadOnly – true/false – defines if the inserted text is read only or user can modify text in protocol
Design protocol template – components

Text

• Component for text input

![Diagram showing component properties]

• Properties:
  • Name – name of the component
  • Label position – left/top – defines position of name
  • External – name of the Plugin used for automatic filling of the component
  • ReadOnly – true/false – defines if the inserted text is read-only or user can modify text in protocol
Hyper link

- Creates text box for web address – active link in PDF file
- Usually used for specification of the equipment

**Properties:**
- Name – name of the component
- Link – link to external web page
Design protocol template – components

Buttons

- Creates N buttons with user defined names
- Just one button can be active at a time
- Usually used for selection of one possibility

Properties:
- Label – text of buttons component
- Orientation – vertical/horizontal – defines orientation of buttons
Design protocol template – components

Checkbox

- Creates N check boxes with user defined names
- It is usually used for passing several steps of the methods

Properties:
- Label – text of checkbox component
- Orientation – vertical/horozintal – defines orientation of checkboxes

Add checkbox

Define what components will be enabled if this checkbox is active

Move/delete checkbox
Design protocol template – components

Buttons/checkbox – enable components

- Click on E button next to button name
- Enable/disable mode is activated
- Click on component – add/remove component from list of components enabled by particular buttonion of one possibility
- Click on OK (red button) to finish Enable/disable mode
Design protocol template – components

Image
• Show the image in the protocol

Properties:
• Path – full or relative path to the image
• Label – text related to the image
• Label possition – Top/bottom – position of label
• ReadOnly – true = user can not change image in protocol, false = user can add or change image in protocol
Label

- The component is static text
- It is usually used for the comments or labels

Properties:
- Name – text which is shown in the form
Design protocol template – components

QR code
- Show QR code
- QR code contains protocol ID + protocol Name + protocol description
- Can be used for identification of the protocol
Design protocol template – components

Table

- Standard table
- The cells filled in protocol template designer are disabled in final protocol

Properties:
- Columns/Rows – number of table columns and rows
- Label – table description
- Label position – top/bottom

Cell is editable in final protocol because it was not filled in design
Design protocol template – components

DropDown

• Component with predefined items

Properties:

• Name – text of component
• Units – user can define units for items
• Editable – true/false – true = user can add new items in protocol, false = user can select only from predefined items
Number

- Real numbers with units

Properties:
- Name – text of number
- Decimal places - number of shown decimal places
- Units – units of number
Design protocol template – components

Date/time

- Information about data, time or combined data+time

Properties:
- Name – text of data/time
- Type – data only/time only/ data+time
- Date format – defines format of date
- Time format – defines format of time

Select time format
Protocol link

- Direct link to other protocols
- Click (+ Ctrl) show linked protocol

Properties:
- Name – text of link
- QR code – true/flse – true’QR code of linked protocol is shown
Standardization

- Click on menu – Terminology
- The window for definition of OWL file appears
- Insert link to OWL file
- Check – use terminology
Standardization

• The terms from terminology will be offered to the user during inserting the name of components
Design protocol template – template manipulation

- Load template from file
- Save template to file
- Save template to database
- Finalize (lock) template
- Create copy of template for modification
- Change protocol template settings
- Show the protocol how it will look for the user
How to create new protocol from template – protocol generator

1. Click on Add on Protocol tab
   - Protocol generator tool is executed
2. Define the name of new protocol
3. Define the protocol template for the protocol
4. Define parent of protocol (concatenation of protocols)
How to create new protocol from template – protocol generator

- Protocol is generated
- The user can fill the information about the experiment
  - All mandatory information about experiment (defined in template)
- User can use predefined recommendations
- The protocol can be used as guide through the experiment if the template was designed for
How to create new protocol from template – fill protocol

• Fill information using plug-in (it has to be defined in template)
• Click on Menu – Fill protocol
• The plug-in will ask for file with external information and try to read it
How to create new protocol from template – attach data

- The tab Experimental data allow user to attach experimental data to the protocol
- The link between protocol (metadata) and data is created
How to create new protocol from template – PDF

- Protocol can be generated into PDF file for printing in several different formats
- Select Menu – Generate PDF
- See “PDF print.pdf” document for more information
How to create new protocol from template – Save

• Save protocol and data into local database
• Protocol and data can be still modified
How to create new protocol from template – Finalize

- Save protocol and data into local database
- Protocol is locked and cannot be modified
- All mandatory fields have to be filled in
How to create new protocol from template – settings

- Change name and description of protocol
- Change parents of protocol – concatenation of protocols
How to edit/read protocol – protocol generator

- Click on Edit on Protocol tab or double click on protocol
  - Protocol generator tool is executed
  - Only the owner (creator) of protocol can change the protocol
  - The rest of users can only download data
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