

CELCAT® Timetabler 7 QLS Import/Export Plugin - Technical Reference

Introduction

The CELCAT *Timetabler* QLS Plugin is used to transfer data between CELCAT *Timetabler* 7 and Agresso QL Students (QLS) software, and is designed to allow the two systems to operate together on shared data. The ‘plugin’ is supplied as part of the CELCAT *Timetabler* 7 Client product and requires additional software support from Agresso Ltd.

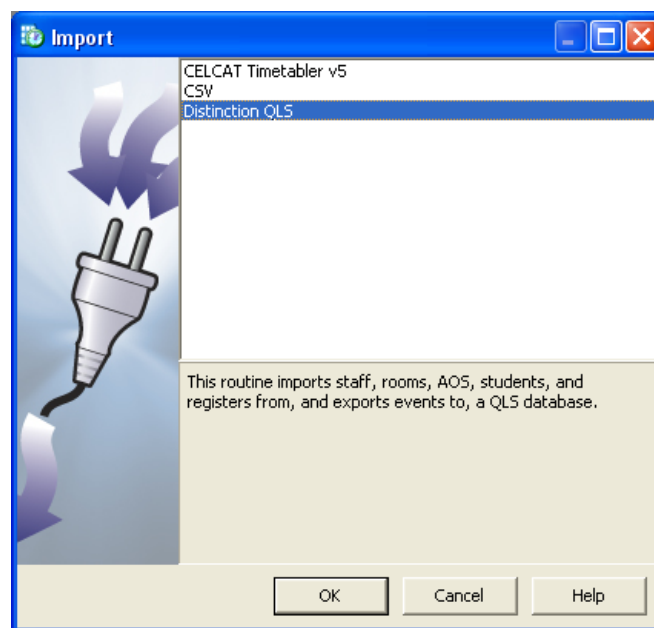
This document explains how to use the QLS Plugin and describes the data transfer mechanism it implements. Note that the QLS Plugin has been designed for general-purpose use, and where the functions it offers do not meet your needs you may wish to commission a bespoke plugin to cater for your exact requirements – contact CELCAT for more information.

These notes are written from the perspective of a CELCAT *Timetabler* user, so we discuss *importing* data from QLS and *exporting* data from *Timetabler*. A familiarity with CELCAT *Timetabler* 7 and Agresso QLS is assumed.

Running the Plugin

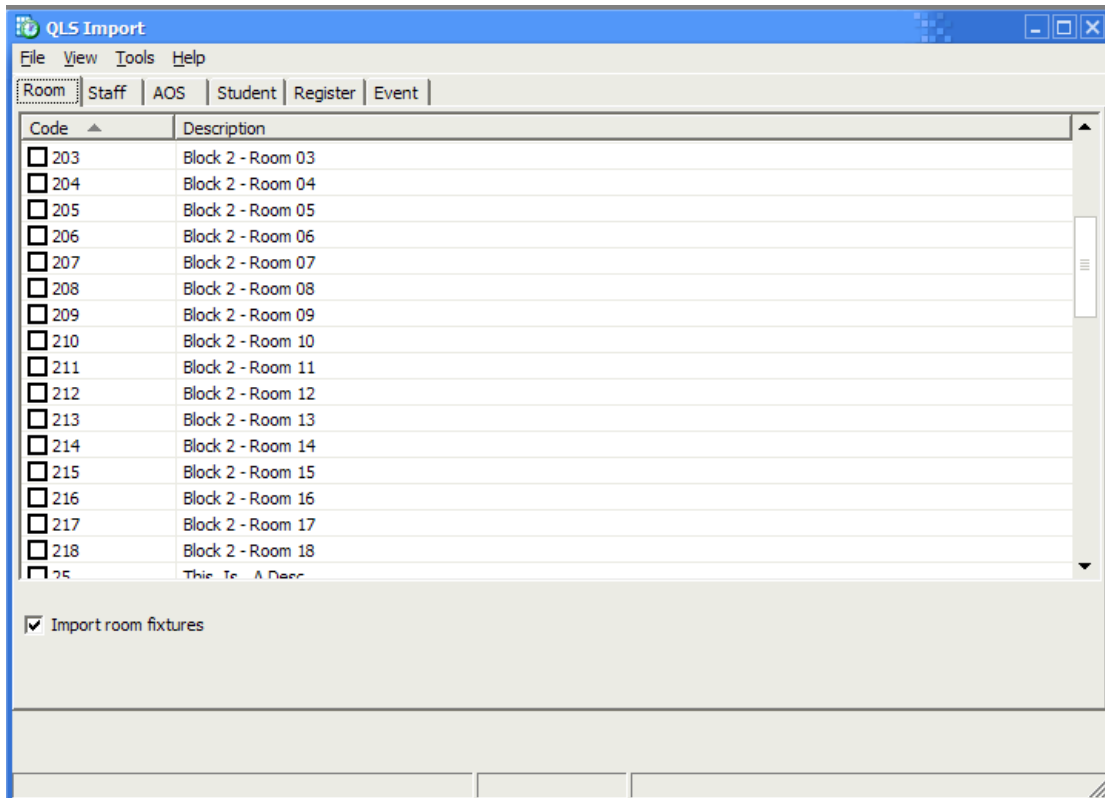
The QLS Plugin is available from the Tools menu of the CELCAT *Timetabler* Client software.

Select **Tools | Timetable Utilities | Import** to display the **Import** window as shown below. Then select the **Distinction QLS** item (Agresso was formerly known as “Distinction Systems”).



Import Window

The QLS Plugin comprises several tabbed pages each corresponding to a data type involved in the import/export function. You can use the **View** menu to hide or display relevant pages (e.g. if you never wish to import rooms into *Timetabler* you should hide the **Room** page).



QLS Plugin

These are the data types that can be imported / exported:

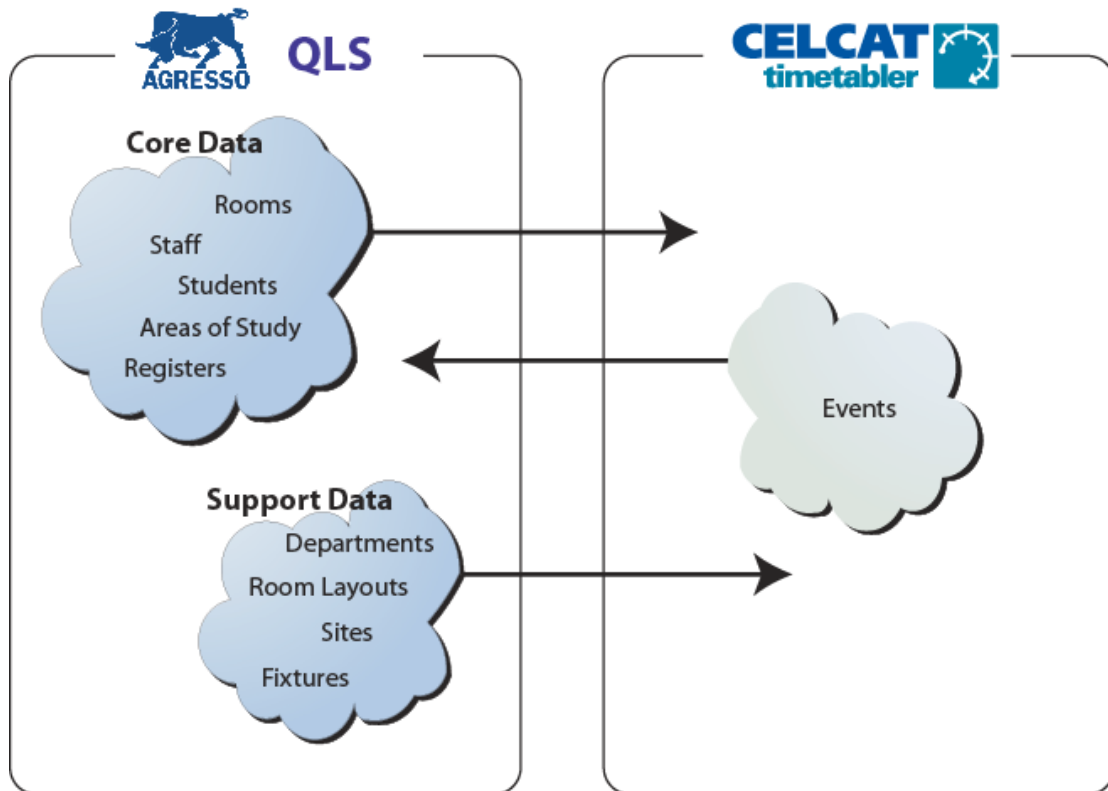
Import from QLS into CELCAT *Timetabler*

Departments, Sites, Room Layouts, Rooms, Fixtures, Staff, Students, Areas of Study (“AOS”), Registers

Export from CELCAT *Timetabler* into QLS

Events

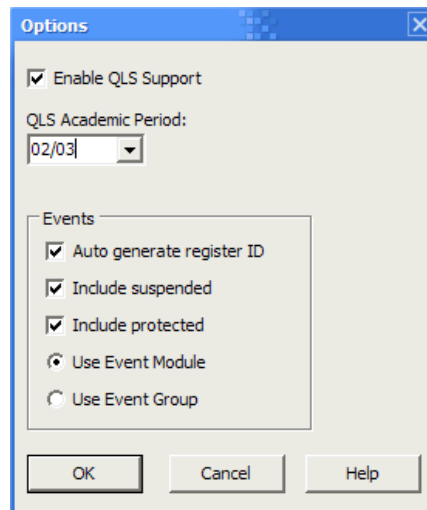
The transfer of data between Agresso QLS and CELCAT *Timetabler* is illustrated in the following diagram:



Data Transfer

Configuring the Plugin

Select the **Tools | Options** command to display the **Options** window as shown below.



Options Window

Enable QLS Support

“QLS Support” must be enabled for your timetable before you can begin to transfer data between the software systems.

Technical note: Ticking the “QLS Support” checkbox enables a trigger in the *Timetabler* database called TG_EVENT_UPDATE_QLS. It is used to record details of event changes in the CT_EVENT_LOG table, which in turn is required when populating the list of changed events in the QLS Plugin’s **Event** page.

QLS Academic Period

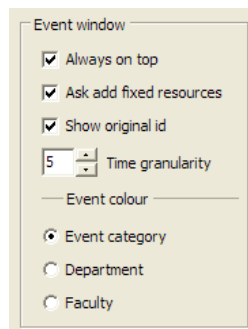
The QLS Academic Period refers to the academic period (or year) in the QLS database. When importing data from QLS it is important to extract data that corresponds to the same time period as that of your CELCAT timetable.

Auto generate register ID

When this option is ticked, a QLS register ID is automatically generated when a new event is added into your timetable.

Technical note: The TG_EVENT_INSERT_QLS trigger is enabled when the “Auto generate register ID” option is ticked. This performs the task of generating a register ID and inserting it into the event’s original_id field. The register ID is created by taking the event’s internal unique key value (an integer) and padding it to 12 characters using pseudo-random character values.

The QLS register ID associated with a *Timetabler* event can be displayed in *Timetabler*’s event window for reference. See the *Timetabler* Client application (**Tools | Options | General | Events | Show original ID**) as shown below.



Event Options

Include suspended

When enabled, this option ensures that suspended events are also included in the **Event** page. The default value is true.

Include protected

When enabled, this option ensures that protected events are also included in the **Event** page. The default value is true.

Use Event Module / Use Event Group

Specify whether CELCAT *Timetabler* modules or groups are used as the reference resource type when listing and exporting events. Your choice will depend on how you use these entities in your timetable.

Other Options

Further options are available on some of the QLS Plugin’s tabbed pages. These are described below:

Import room fixtures

This checkbox appears on the **Room** page and should be ticked if you want to transfer room fixtures (items of equipment) from QLS into your timetable.

Active/Inactive/Both

This group of buttons appears on the **AOS** page and is used to specify what QLS Areas of Study to import into *Timetabler*.

Import as Groups

This checkbox (on the **AOS** page) should be ticked if you want to import QLS Areas of Study as CELCAT *Timetabler* Groups. If the checkbox is left unticked, they are imported as Modules.

Modified Since

On the **Register** page, the “Modified since” control allows you to limit the display of QLS registers to those modified since the specified date (non-inclusive).

Similarly, on the **Event** page, the “Modified since” control allows you to limit the display of *Timetabler* events to those modified since the specified date (non-inclusive). However, note that if more than one *Timetabler* event corresponds to a single QLS register and one of these events has been changed since the specified date, all of these associated events will appear in the list.

Register Description

Use these controls on the **Event** page to specify how the QLS register description should be generated when exporting events from *Timetabler*.

Event Category

These controls on the **Event** page allow you to limit (by event category) the events that should be displayed.

Data Mapping

Data is effectively shared between CELCAT *Timetabler* and Agresso QLS, which requires a well-defined mapping of entities and their attributes between the two systems. The following table describes the shared entities and shows their correspondences. The resource data (rooms, staff, etc) originates in QLS and is only ever transferred one way (from QLS into *Timetabler*). However, the event data can be transferred in both directions. This allows CELCAT *Timetabler* events to be used to generate register headers in QLS, and QLS registers to be used to create events in *Timetabler*.

Technical note: In all cases, the CELCAT *Timetabler* `origin_id` and `original_id` fields are used to record the origin of the record. For example, when a room is imported from QLS, the room’s code (as used to uniquely identify the room in QLS) is stored in the room’s `original_id` field (in *Timetabler*’s room record). The QLS Plugin automatically creates a single `origin_id` value for all of your imported records (allowing the QLS Plugin to distinguish between multiple import sources). The result is that the QLS Plugin can easily match items and manage subsequent changes to your imported records.

Departments

From Agresso QLS	To CELCAT Timetabler	Comments
Code or Description	Name	Either the QLS department <i>code</i> or <i>description</i> is used depending on your setting of the relevant QLS export option
Code	Original ID	

Note that if you change a department’s Name in *Timetabler* and re-run the QLS Plugin, the Name will revert to its value in QLS. QLS is therefore considered the master source of department names.

Rooms

From Agresso QLS	To CELCAT Timetabler	Comments
Code	Unique name	
Description	Name	

Telephone	Telephone	
Department code	Department ID	Via link to department entity
Site	Site ID	Via link to site entity
Area	Area	
Code	Original ID	

Note that when changes are made to any of the above room fields in *Timetabler*, these changes will be overwritten the next time the QLS Plugin is run and the room imported. Thus QLS is considered the master source of this room information. However, if other attributes of the room are modified in *Timetabler* (such as the default capacity, access for the disabled, etc) then these attributes are retained.

Room Layouts

From Agresso QLS	To CELCAT Timetabler	Comments
Name + Description	Name	
Description	Description	
Name	Original ID	

When rooms are imported from QLS, any associated room layouts and capacities are also imported. Although a single room in *Timetabler* can have multiple layouts, the QLS Plugin can only import a single layout from QLS. If you add extra layouts for a room in *Timetabler* then these are retained and are *not* overwritten when the QLS Plugin next runs and the room re-imported.

Sites

From Agresso QLS	To CELCAT Timetabler	Comments
Name	Name	Derived directly from the QLS room record (the Site field) rather than from a separate 'Site' table
Name	Original ID	

A site is an attribute of the 'room' entity. If the name of a site is changed in *Timetabler*, it can still be matched by the unique_id field and is overwritten by the QLS data when the QLS Plugin is next run.

Fixtures

From Agresso QLS	To CELCAT Timetabler	Comments
Description	Name	
Code	Original ID	

A fixture is a fixture or fitting in a room. See **Inventory** below. Note that the Fixtures and Inventory are only imported from QLS if the **Import room fixtures** checkbox on the QLS Plugin's **Room** page is ticked.

Inventory

From Agresso QLS	To CELCAT Timetabler	Comments
Room Code	Room Original ID	
Fixture Code	Fixture Original ID	
Quantity	Quantity	

A room inventory is the list of fixtures associated with each room.

Staff

From Agresso QLS	To CELCAT Timetabler	Comments
Code	Unique name	
Name	Name	
Honorific	Title	
Address	Address1	The QLS staff address is truncated to 64 characters and placed in the <i>Timetabler</i> address1 column
Department code	Department ID	Via link to department entity
Staff Office	Room ID	Via link to room entity
Home tel	Home tel	
WWW	WWW	
Code	Original ID	

Note that when changes are made to any of the above staff fields in *Timetabler*, these changes will be overwritten the next time the QLS Plugin is run and the member of staff imported. Thus QLS is considered the master source of this staff information. However, if other attributes of the staff record are modified in *Timetabler* (such as the tag values, special needs flags, etc) then these attributes are retained.

Students

From Agresso QLS	To CELCAT Timetabler	Comments
Code	Unique name	
Name	Name	The QLS student name is truncated to 128 characters
Date of birth	Date of birth	
Gender	Sex	
Code	Original ID	

If a student record is modified in *Timetabler*, your changes will be overwritten when the QLS Plugin is next run and the student record imported. QLS is considered the master source of these student attributes.

Areas of Study

From Agresso QLS	To CELCAT Timetabler	Comments
Code + Separator + Period	Unique name	Note the fabrication of the unique identifier from aos code and period of study separated by the separator character
Description	Name	Course description truncated to 128 characters
Academic year	Year	
Department code	Department ID	Via link to department entity
WWW	WWW	
Code + Separator + Period	Original ID	

An “Area of Study” is QLS terminology and usually corresponds to a CELCAT *Timetabler* “Module” or “Group” (depending upon your setting of the **Import as groups** checkbox in the QLS Plugin’s **AOS** page). QLS is considered the master source of AOS data.

Technical note: When importing resource records from QLS into *Timetabler*, care is taken to ensure that inserts and updates are only performed when absolutely necessary. For example, when importing a room from QLS, if it already exists in *Timetabler* (as determined by the original_id value), the record will be checked to see if any changes are required (i.e. field values have been modified in QLS) and only updated if necessary.

Registers

From Agresso QLS	To CELCAT Timetabler	Comments
Day of week	Day of week	
Start time	Start time	
End time	End time	
Department code	Department ID	Via link to department entity
Weeks	Weeks	
Register ID	Original ID	

When importing registers, the QLS Plugin matches registers against events using the QLS ‘Register ID’. This value is stored in the original_id field of *Timetabler* events. See below under “Registers and Events” for more information.

Events

From CELCAT Timetabler	To Agresso QLS	Comments
Day of week	Day of week	
Start time	Start time	
End time	End time	
Register ID	Register ID	
Description	Description	
Department	Department	

Resource Assignments

Resource assignments are simply the lists of resources allocated to events/registers. These are transferred when importing registers from QLS and when exporting events from *Timetabler*.

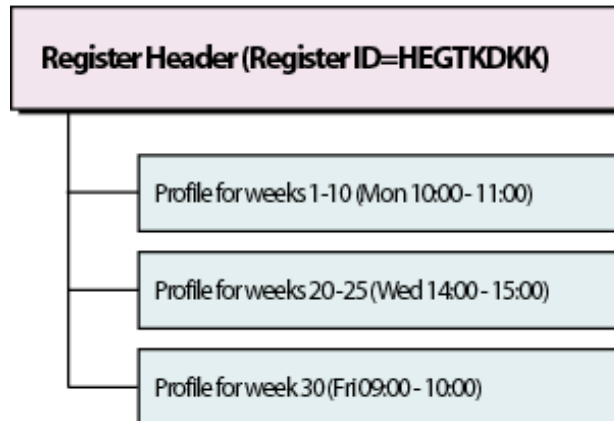
Registers and Events

The QLS Plugin provides for importing core resources (such as rooms, staff, etc) from QLS, but this data is never exported back from *Timetabler* to QLS. The situation is different with event/register data, which can be transferred in both directions. This section describes the way Agresso QLS ‘Registers’ and CELCAT *Timetabler* ‘Events’ interact.

QLS Registers

A QLS register comprises a register header identified by a ‘Register ID’ and any number of associated register profiles. Each profile contains detailed information about the register in a specified span of contiguous weeks. Profile records never contain overlapping weeks. This arrangement is depicted below.

The QLS Register



Additionally, each of the profiles contains a ‘fixed’ set of resources that participate in the register in *all* weeks of the profile.

CELCAT Timetabler Events

A *Timetabler* event occurs on a particular day of the week and at specified start and end times. It can run in any of the weeks of your timetable (not just contiguous spans). Furthermore, resources (e.g. staff, rooms etc) allocated to an event can participate in any or all of the event’s weeks.

Often there is a one-to-one relationship between *Timetabler* events and QLS registers, but the above description shows that this may not always be the case. For example, in the QLS register depicted above, the three profiles could not be accommodated in a single event since they occur on different days (and at different times). So when importing a register like this, the QLS Plugin must generate three events – one for each of the profiles. The QLS Plugin manages the complexity of mapping registers to events and vice-versa. In particular, when importing registers:

1. Profiles are matched against existing events and/or new events are created to accommodate the data.
2. Extraneous events (which are no longer required to represent the register data) are removed. Although this is not an error condition, a message is provided in the error log when this happens.

When exporting events from *Timetabler*:

1. Care is taken to ensure that registers are created in QLS with contiguous week profiles and where the resources are allocated in all weeks of the profile.

The consequence of this is that you are free to split events in *Timetabler* (where the newly created events will automatically retain the original register ID), allocate a resource to a subset of an event’s weeks, etc, without worrying about the transfer of the data to QLS – the Plugin manages this complexity for you.

An Event Export Example

The following example serves to illustrate how a complex *Timetabler* event is processed during the export operation.

Part of the *Timetabler* event description:

Day Monday
 Time 9:00 – 10:00
 Weeks **1-10, 20-30**
 Rooms **A101** (wks **1-5**), **B111** (wks **6-10, 20-30**)
 Staff **Jones** (wks **1-10**), **Smith** (wks **20-30**)

Note that the event has two non-contiguous week blocks (1-10 and 20-30), and that the event's resources vary from week to week.

When exporting this event to QLS, the QLS Plugin partitions the event thus:

1. Weeks **1-5** (Room **A101**, Staff **Jones**)
2. Weeks **6-10** (Room **B111**, Staff **Jones**)
3. Weeks **20-30** (Room **B111**, Staff **Smith**)

These partitions correspond to the QLS register profiles that are created.

A Register Import Example

In this example, a QLS register is processed during the Import Register operation.

The QLS register comprises the following profiles:

1. **Monday, 10:00-11:00**, Weeks **1-5**. Room **X433**, Staff **Wright**
2. **Monday, 10:00-11:00**, Weeks **10-20**. Room **X433**, Staff **Street**
3. **Wednesday, 10:00-11:00**, Weeks **21-30**. Room **W277**, Staff **Wright**

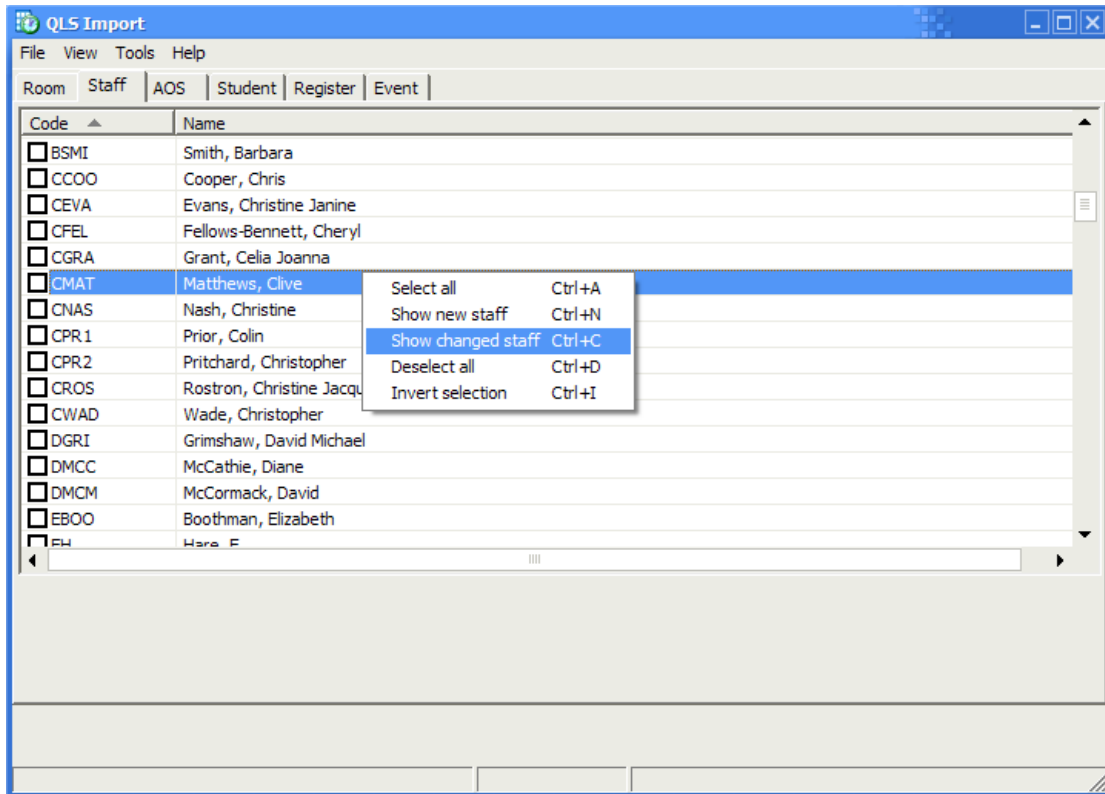
When importing this register into *Timetabler*, the QLS Plugin builds the following two events:

1. **Monday, 10:00-11:00**, Weeks **1-5, 10-20**. Room **X433**, Staff **Wright** (wks **1-5**), **Street** (wks **10-20**)
2. **Wednesday, 10:00-11:00**, Weeks **21-30**. Room **W277**, Staff **Wright**

Note how the first two register profiles can be combined into a single event because the day and times are identical.

Filtering Lists

The QLS Plugin has a popup menu on each page that is accessed using the right mouse button. The menus have commands to make selections, filter the lists according to certain criteria, etc. For example, the **Staff** page popup menu shown below can be used to limit the list of QLS staff to those that have changed (i.e. where the record values differ from those currently in your timetable).



Synchronising

Select the **File** menu, **Synchronise** command to run the QLS Plugin. The sequence of operations is as follows:

1. Check for Duplicate Original ID Values

A check is performed to ensure that there are no duplicate `original_id` values for resources in the *Timetabler* database.

Each resource record in *Timetabler* (room, staff etc) has a field called “`original_id`” which is used in conjunction with an “`origin_id`” field to identify the origin of the record. When resources are imported into *Timetabler* from QLS the `original_id` field is used to store an ID value that uniquely identifies the record in QLS. It is therefore important that there are no duplicate `original_id` value in the *Timetabler* records. If duplicates are found, details are written to the error log and the whole process is aborted.

2. Import Departments

The QLS department records are imported. All departments are processed (there is no way to select which departments to import). Departments are only imported if you have one or more of the following pages enabled (not hidden): **Room, Staff, Student, AOS**.

3. Import Sites

The QLS site records are imported (unless the **Room** page is hidden).

4. Import Room Layouts

The QLS room layout records are imported (unless the **Room** page is hidden). These are simply the room layout types that are in use by the rooms that you wish to import. If you do not select any rooms to be imported then no layouts will be processed either.

5. Import Rooms

The selected QLS rooms are imported.

- 6. Import Fixtures**
The QLS equipment records are imported.
- 7. Import Inventory**
The QLS inventory is imported (the details of the fixtures in each room).
- 8. Import Staff**
The selected QLS staff records are imported.
- 9. Import Students**
The selected QLS student records are imported.
- 10. Import Area of Study**
The selected QLS 'area of study' records are imported.
- 11. Import Registers**
The selected QLS registers are imported, creating or updating events in *Timetabler*. Note that when importing registers, if a resource assigned to the register does not exist it will be ignored.
- 12. Export Registers**
The selected *Timetabler* events are exported to QLS, creating registers in QLS.

Errors

If errors are detected during the Synchronisation process, a log file is created which can be viewed using the **View** menu, **Error Log** command.

There follows a list of the error messages that may appear in the log:

Field is too long and has been truncated

When importing data from QLS, if the value is too long to store in the CELCAT *Timetabler* database, it will be truncated. The limitations are as follows:

- Student names – 128 characters
- AOS descriptions – 128 characters

Events associated with register 'xxx' have overlapping weeks. Register has not been exported

Several *Timetabler* events are associated with the single register 'xxx' (this can occur for example when an event is split). You can only export one or more of these events if their weeks do not overlap.

Register 'xxx' belongs to a department that doesn't exist in QLS

When exporting events to QLS, if an event belongs to a department that doesn't exist in QLS then the above error is reported. Note that the event is still exported but without a department attribute.

No matching event was found for register: 'xxx'

When importing registers into CELCAT *Timetabler*, the above error is reported if more than one event exists for a register, but the QLS Plugin has been unable to match the register to one of these events. A 'match' is based on a temporal comparison – day of the week, weeks and start/end times. This means that the event's temporal attributes have been modified in CELCAT *Timetabler*. In these circumstances, the QLS Plugin will create a new event for the register and discard the original event (unless the original event is matched with another profile in the same register).

Another entry for register 'xxx' was also found and included in the import procedure

When importing registers, a register ID may appear multiple times in the **Register** page. This is an indication that the register contains a number of profiles (see above under “Registers and Events”). If you select just one of these rows then the QLS Plugin automatically includes the other profiles too and inserts the above information into the error log.

Another event for register ‘xxx’ was also found and included in the export procedure

When exporting events, a number of listed events may correspond to a single register ID. If you have only selected one of these rows then the QLS Plugin automatically includes other events with the same register ID. This ensures that the complete ‘register’ is transferred to QLS. Note that in some cases a related event may not appear on the **Event** Page because it hasn’t been modified since the specified ‘changed since’ date. If this is the case, the QLS Plugin still detects the condition and automatically includes all appropriate events for you.

Cannot update Room “ABC” – error message...

Cannot insert Room “ABC” – error message...

These messages (and variations) describe generic errors raised by the database server software. Please see your SQL Server documentation for more information.

Duplicate Room record found – “ABC” (there are 2 duplicates)

This message (and variations) means that one or more of your *Timetabler* resource records have duplicate `original_id` values. Each resource record in *Timetabler* (room, staff etc) has a field called “`original_id`” which is used in conjunction with an “`origin_id`” field to identify the origin of the record. When resources are imported into *Timetabler* from QLS the `original_id` field is used to store an ID value that uniquely identifies the record in QLS. You should remove any duplication.

Event xxx preserved

When registers are imported into *Timetabler*, sometimes an event is deemed superfluous and is earmarked for removal. However, if there are any problems creating new event(s) for the register, then the specified event is preserved.

The following event(s) were deleted during import of register...

This information message is used to list the IDs of events that have been deleted during the import of registers into *Timetabler*.

Deleted Records

When resource data (rooms, staff etc) is deleted in QLS, the Plugin does not automatically remove any corresponding data records in *Timetabler*. This is by design. If you need functionality that does not exist in the QLS Plugin please contact us to discuss your requirements.