User guide for **KeyGML 3**
OS MasterMap to AutoCAD Reader

To work within AutoCAD 2007 to 2012 and Bricscad V11 Pro

Introduction

KeyGML* has been developed by KeyTERRA-FIRMA Ltd. to meet the requirements of CAD users throughout England, Scotland and Wales who are using OS MasterMap. Data is supplied in .gz files that KeyGML can read directly. The product is a CAD application working within a full AutoCAD (not LT) or Bricscad.

The aim of KeyGML is to provide an intelligent, structured and selective input to CAD with a high degree of user control relating to the OS feature codes and themes. With the introduction of the seamless map through the Digital National Framework project OS MasterMap is a "geographical database" reflecting the real world including polygons representing man-made and natural features. Each feature has a unique Topographic Identifier (TOID) and these are included in the input to CAD together with (optional) additional attribute data. The limitations of data supplied only in 1:1250 and 1:2500 tiles etc. are now overcome with no more sheet edge mismatching etc. however KeyGML does include a number of tile utilities to help users work with existing data and systems.

KeyGML will read one or multiple .gz files for input to CAD by a "selection set of files" or by picking one folder where the .gz files are stored (.gml files unzipped from .gz files can also be read). An important feature is to define an area of interest in the CAD drawing by a closed polyline, circle or buffer and only data defined by this location will be imported from OS MasterMap into the CAD drawing. The data can be very large and the ability to read into CAD in a seamless way only the mapping data that is required for a specific project or study helps keep drawing size to more manageable levels. Traditional tiles can also be written in batch mode.

Software protection

The software may be protected by a USB dongle (parallel dongle is available on request) or by Network Licensing (NLM) software. The NLM software is available at an additional cost. Users with existing CAD application software from the Key Systems Group of Companies may add a KeyGML licence to their existing parallel or USB dongles or add KeyGML(s) to an existing Key Systems NLM.

Evaluation

KeyGML may be supplied on request with a USB dongle to be "licenced for evaluation" and then have a number of tokens added to it from www.keygml.co.uk/licence. Users with existing Key Systems dongles may also add a KeyGML Evaluation licence to their dongle and add tokens as above.

* GML = Geographic Markup Language

KeyGML Reference Manual Rev.11 June 2011
KeyTERRA-FIRMA Ltd.
01527 68888
www.keycivil.com
support@keycivil.com

Installation

See the Installation notes included with the CD packaging or as a pdf with the software.

KeyGML Licence configuration

When the program takes you to the licence configuration dialogue you have these options :-

1. **Hardware lock (dongle).** These three buttons will be grayed out if there is no Key Systems dongle connected to the computer. Note that the small light on the usb dongle should be on.

   a. *Licence lock* will prompt with an ID number and request a Release code to authorise the dongle. Obtain this code from www.keygml.co.uk/licence or telephone KeyTERRA-FIRMA Ltd. 01527 68888 to obtain a full licence. No action is required if the dongle is supplied "ready authorised".

   b. *Licence lock for Evaluation* will authorise the dongle to work in evaluation mode and be ready to accept tokens (see below). This button will be grayed out if the dongle is already authorised for demo status.

   c. *Add tokens to Evaluation lock* will prompt with an ID number and request a Top up code. Obtain this code from www.keygml.co.uk/licence or telephone KeyTERRA-FIRMA Ltd. 01527 68888. When the Top up code has been entered tokens will be deposited into the lock. This button will be grayed out if the dongle is already fully licenced.

2. **Network licensing (NLM)**

   Configure Network Licensing will take you to a dialogue where you can add/edit network licensing parameters. Please consult your IT person about the values needed for these edit fields. Check with KeyTERRA-FIRMA Ltd. to see if you have existing Key NLM software installed.

KeyGML Template drawing

It is not essential to start a new drawing using the KeyGML.dwt template but this is strongly recommended as it does make CAD more appropriate with example layers and includes drawing settings such as :-

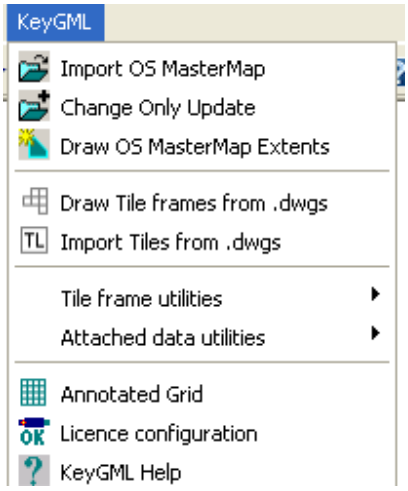
Units	Metres to 3 decimal places
Angular base	Deg. Min. Sec. Whole Circle Bearings Clockwise 0 deg. North up the screen
Style	Romans with height set to 0
UCS	World
Space	Model
Limits	Turned off
Plinegen	1
Plinetype	2
Blipmode	Turned off
Pdmode	2
Pdsize	0.5

Contents

	Page
Import OS MasterMap	3
Batch mode	
Land-Line type traditional tile drawings from drawn frames	7
Land-Line type traditional tile drawings from tile list .txt file	8
Change only update	9
Import Tiles from .dwgs	9
Draw Tile frames from	
existing drawings as created by running batch mode	9
chunk extents (from OS MasterMap files)	9
reference (e.g. SS7887SW)	10
picked points	10
attached data	10
Annotated Grid	11

KeyGML 3

Command Reference



KeyGML pull down menu

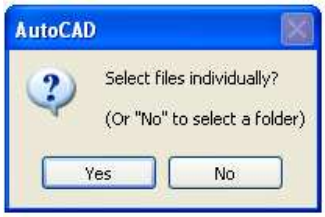


KeyGML toolbar

Import OS MasterMap

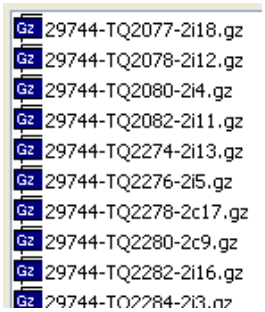
Purpose

To read one or more .gz or .gml files to draw the map with a range of user controlled drawing settings and area of interest specifications. This is the main function to read the OS MasterMap data and to draw in CAD.



Operation

The default option is to select one or more .gz or .gml files. Alternatively click "No" to choose a folder that will include one or more .gz or .gml files.



The main dialogue has three specific panels :-

1. At the top there is a list displaying information about the selected files.

2. Unit count displays a running count for all the "components" in each file as it is being read. Click the **Count…** button to do counting only.

3. Location / Property filtering controls input by the use of :-

   Property filters i.e. Themes, Groups and Terms. For typical use this will be "off" but to read in only by selected properties (e.g. Rail only) add or delete to the three lists. These filter setting may be saved to a .pfd file and for future inputs requiring the same settings can be loaded from an existing .pfd file.

   Location filters enables filtering by location(s) defined by one or more polylines or buffers etc. Use this option to extract only an area of interest from one or more files. To read in complete files or chunks this should be "off". Settings here are used to control the writing of traditional "tiles" in batch mode. See page 5 for more details.

Along the bottom of the main dialogue :-

Options…

Layer definitions for Topographical and Cartographical data

For typical use the feature codes in the OS MasterMap files are assigned to the "standard" layer names in the Lookup table. These layers may exist in the template drawing with existing definitions for colour and linetype by layer. Use the **Feature / Layer Lookup Table…** Add, Edit and Delete options to make any changes. Also see additional note on page 11 about advanced filtering options.

If a feature encountered within the data is not in the Lookup table the default option is to use the feature code as the layer name but alternatives exist to ignore the feature or to use a layer called "CodeNotFound".

Instead of using the Lookup table there is an alternative method to use the OS Feature Code as the layer name. If all text is required to be on a specified layer turn "Force Text to a fixed Layer" "on".

Cartographical Symbol input options

For typical use the feature codes in the OS MasterMap files are assigned to the "standard" layer names in the Lookup table. These layers may exist in the template drawing with existing definitions for colour and linetype by layer. Use the **Feature / Layer Lookup Table…** Add, Edit and Delete options to make any changes.

If a feature encountered within the data is not in the Lookup table the default option is to use a Point entity but alternatives exist to ignore the feature or to use a named block. Only use the "All as fixed block name:" option to represent all symbols as one named block or the "All as CAD Point entities" to represent all symbols as points.

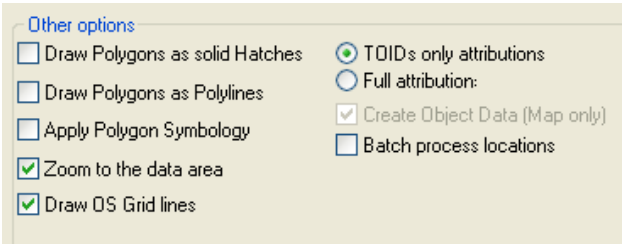
Nominal scaling factor sets the height of text and blocks to be appropriate for the intended scale of plotting (the real scale is of course 1 : 1).

ITN settings… provides ITN specific layer settings etc.

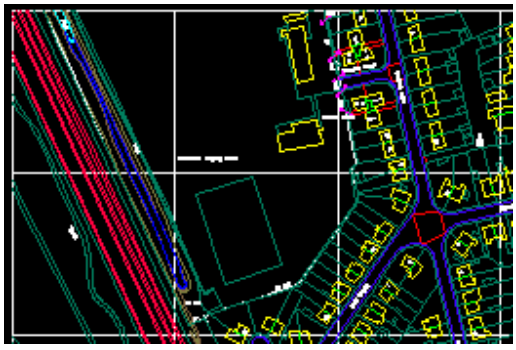
Address settings… provides controls for address data.

Symbology settings… for advanced users to define "area symbol block fill" for Polygon Symbology (see below).

Other options



- Draw Polygons as solid Hatches — "On" to represent all polygons as sold hatches.
- Draw Polygons as Polylines — "On" to draw all polygons as polylines.
- Apply Polygon Symbology — "On" to generate area representation (e.g. areas of conifers).
- Zoom to the data area — Performs a zoom extents before the entities are drawn.
- Draw OS Grid lines — Draws 100 metre grid lines on layer Grid.



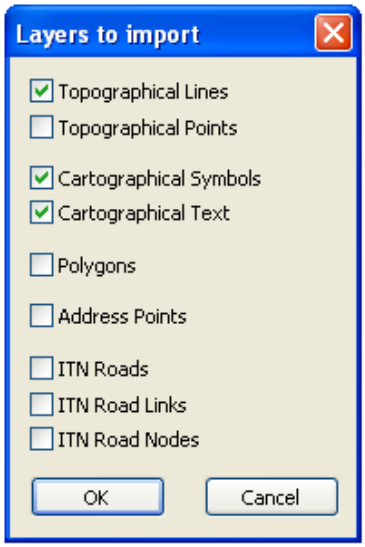
° TOIDS only attributions ° Full attribution	For all typical use this option is suitable to define unique features. This will make the drawing much larger by reading in and storing as Xdata features such as Feature Code, Theme and Latest Change Date.
□ Create Object Data (Map only)	Available in Autodesk Map only this writes attributions as Object data.
□ Batch process locations	"On" to enable "WBLOCK out" function that will create CAD drawings from areas defined by closed polylines in the current drawing. See "Batch drawing production" below – use this option to write traditional tiles.
□ Write CSV files	Respecting the TOIDs only or Full attribution settings above this option writes attributions to a .csv file plus a .txt header file.

Layers to import

"Layers" here refers to OS MasterMap layers and not layers in the CAD drawing.

□ Topographical Lines	"On" to draw all linear features as polylines
□ Topographical Points	"Off" for typical use.
□ Cartographical Symbols	"On" to draw symbols such Benchmarks
□ Cartographical Text	"On" to draw road names & house numbers etc. (respecting the current text style)
□ Polygons	"On" to represent polygon data as polylines or hatches.
□ Address Points	"On" to draw address data.

The ITN settings enable selective input of the different types.



Settings for typical Land-Line type drawing output

Cancel To return to the CAD command prompt.

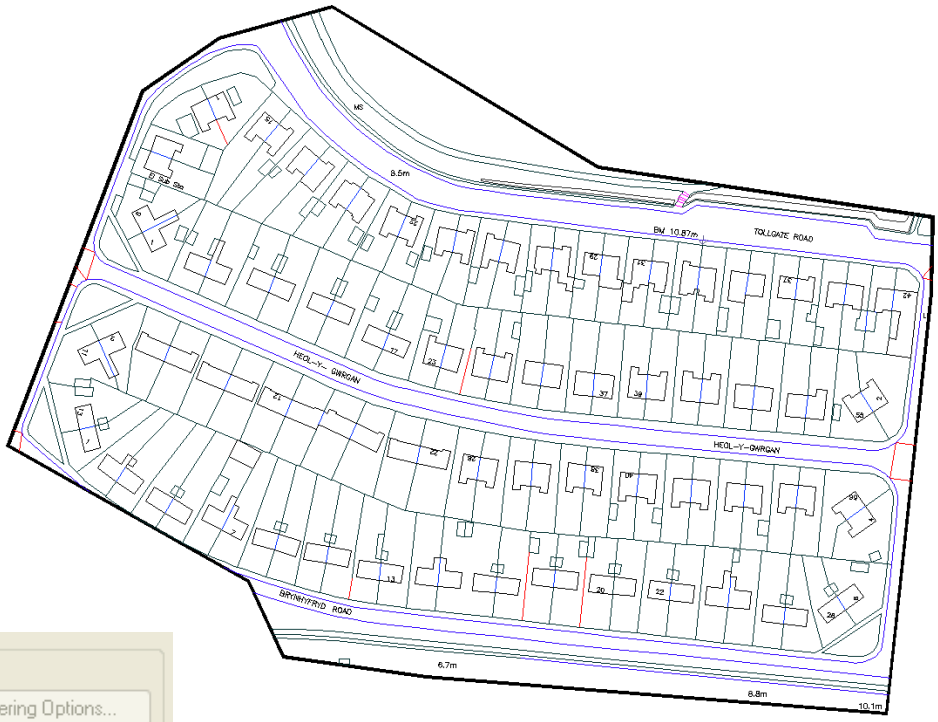
Preview To read the file(s) and display in drawing as graphic only.

Draw To start drawing after confirming or changing the settings.

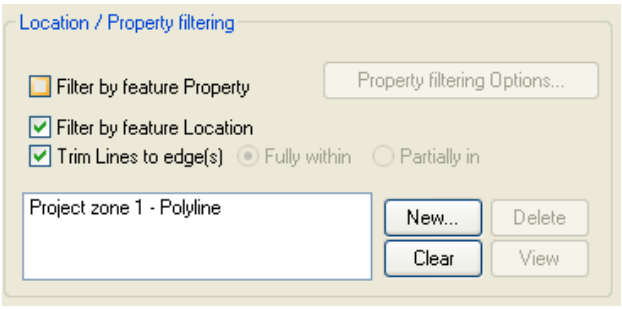
Location filters

 Filter by feature Location
"On" to define area(s) of interest only to draw from the file(s).

 Trim Lines to edge(s)
"On" to work as if using the CAD Trim command for "clean" edges or alternatively options exist for CAD like Window or Crossing Window selection sets



Example of data extracted by location/boundary polyline
Reproduced by permission of Ordnance Survey
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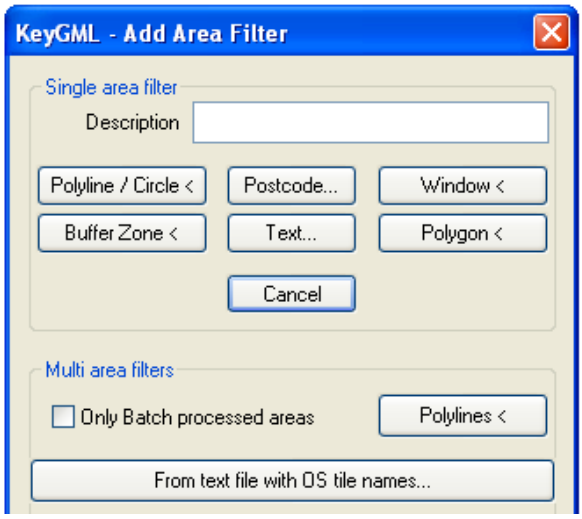
Typical settings to produce the above drawing from Polyline boundary

How to define location filters

One or more location filters need to appear in the list before they can be applied. In the example above there is only one filter named "Project zone 1" that has been defined by a polyline representing the boundary.

New… To add filter to the list (type in the description first).

Polyline / Circle Pick existing polyline or circle.
Buffer Zone Pick a polyline and enter "offset".
Postcode Enter Postcode to define area (additional address point data file is required).
Text Enter text to be searched for and "draw frame" size.
Window Fix rectangular area by picking to points.
Polygon Pick 3 or more points to define area.

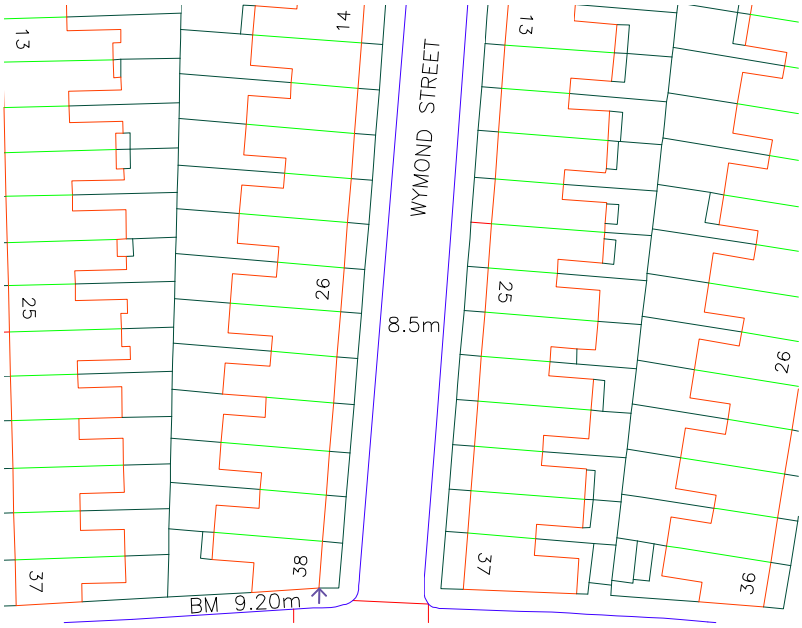


Dialogue for defining filters

Clear Removes all filters from the list.

Delete Deletes highlighted filters from the list.

View Display only filter result.



Result of text filter on "8.5m"

Batch drawing production 1

Creating Land-Line type traditional tile drawings from drawn frames

This feature enables the creation of hundreds of drawings from one or multiple OS MasterMap files and could be considered as an "automatic WBLOCK" function. The drawing files produced will be saved in a specified directory. The areas to be "WBLOCKed out" must be defined in the current drawing as closed 2D polylines and for typical use they will have been drawn by menu item *Tiles and Grid, Tiles from picked extents*. These polylines include xdata so that the tile references will be used for the drawing names.

This method can help manage the large amount of data when combined with the Autodesk Map *Attach Drawings* function. Note that OS MasterMap is intended to provide seamless data without using tiles but many users can benefit by this technique when combined with their existing data and software that is used to help manage the map drawings. Note that when large number of 1:1250 and/or 1:2500 tiles have been created it is not practical to use the *Change Only Update* option. In this example output drawings would be like this :-

G:\OStiles\TQ2075NE.dwg
G:\OStiles\TQ2076SEdwg
G:\OStiles\TQ2076NE.dwg
G:\OStiles\TQ2077SE.dwg

Stage 1

Draw File Query Extents to outline your OS MasterMap chunk's geographical extents.

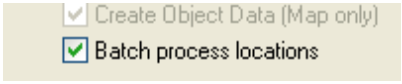
Stage 2

When you know the south west and north east extents for the intended coverage *Tiles and Grid, Tiles from picked extents* to draw the tiles.

TQ2076NE	TQ2176NW	TQ2176NE	TQ2276NW	TQ2276NE	TQ2376NW
TQ2076SE	TQ2176SW	TQ2176SE	TQ2276SW	TQ2276SE	TQ2376SW
TQ2075NE	TQ2175NW	TQ2175NE	TQ2275NW	TQ2275NE	TQ2375NW

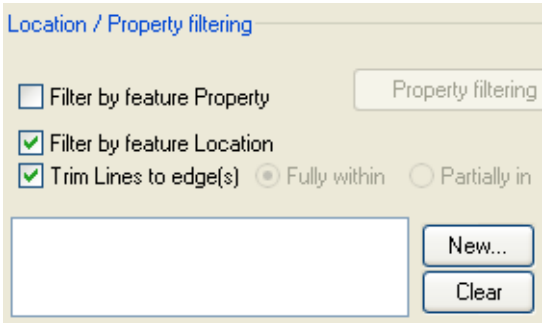
Stage 3

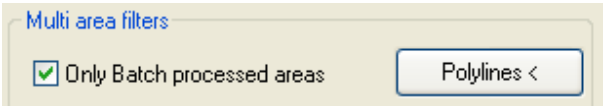
Click Options… to set this “on” :-



Stage 4

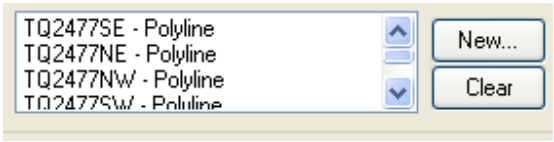
Location / Property filtering with these Filter and Trim settings :-
Use the “Clear” button to remove any existing definitions in the list.
Click “New”
Set “Only Batch processed areas” “on”.





Click Polylines < to select the Polylines drawn in stage 1.

The filter list should now look like this :-



Stage 5

Click the Start button and choose a suitable folder to write all the drawing files to.

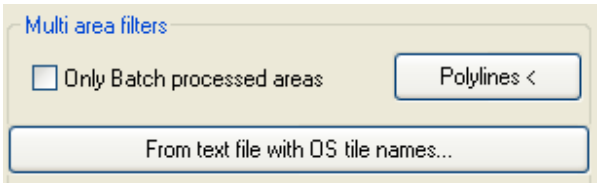
Batch drawing production 2

Creating Land-Line type traditional tile drawings from file names listed in .txt file

This feature enables the creation of drawings from one or multiple OS MasterMap files in a similar way to Batch drawing production 1 above but instead of the locations being defined by frames they are listed in a simple ascii file that needs to look like this :-

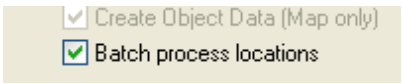
```
SS7888SE
SS7887NE
SS7887SE
SS7886NE
Etc.
```

Location / Property filtering with Filter and Trim settings as shown above.
Use the “Clear” button to remove any existing definitions in the list.
Click “New”



In the “Add Area Filter” dialogue click “From text file with OS tile names” and select the .txt file. The filter list will now display the tile references.

Click Options… to set this “on” :-



Click the Start button and choose a suitable folder to write all the drawing files to.

Change Only Update

Purpose

To update the CAD drawing from change only OS MasterMap file. At present it is not practical to apply change only updates to a set of hundreds of drawings created in batch mode. Note that this is possible due to xdata storing the TOID and version data. This program has to interrogate every entity in the drawing to see if it has been updated in the new file and it may take a little time to complete the operation.

Operation

Select one update only file.

The dialogue is the same as the main input but with an **Update** button instead of Draw.

Other options now include the option to save the departed (or replaced) features to a specified layer.

Draw OS MasterMap Extents



Purpose

To show the extents of data within one or multiple .gz and/or .gml file(s).

Operation

Choose the top option to draw actual data extents or bottom option to draw as rectangle(s).

Select file(s).

↵ to accept default layer for drawing on or enter alternative.

Draw Tile frames from .dwgs

Purpose

To show the coverage by drawing tile frames of all the stored tile drawings (typically created by batch mode). Note that the path to where the drawings are stored may be modified by the next menu item.

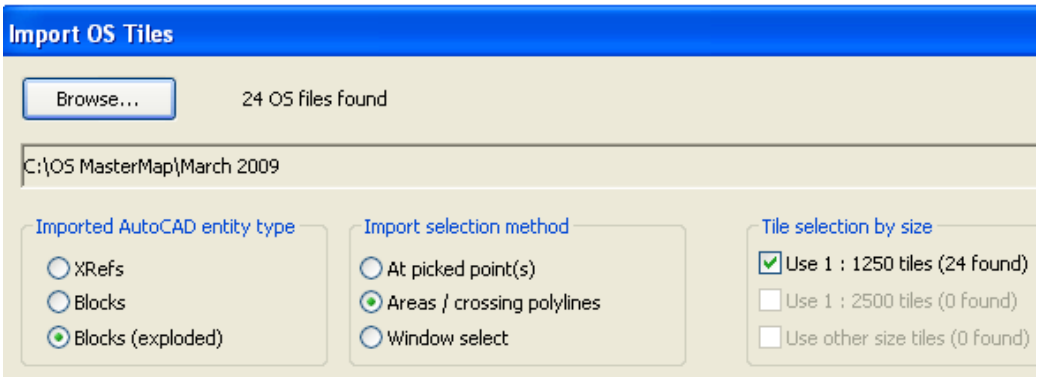
Operation

↵ to accept default layer for drawing on or enter alternative.

Import Tiles from .dwgs

Purpose

To help manage the use of stored tile drawings created by batch mode by XRefs or inserting blocks.



Operation

Browse to set the path to where the tile drawings are stored or accept default.

Select to import the tile drawings as Xrefs, Blocks or exploded Blocks.

The tiles to be imported into the drawing may be defined in three ways :-

At picked points	Pick a point and the tile that the point is within will be imported.
Areas/crossing Polylines	Pick an open Polyline to import the tiles it crosses over (like Fence selection set).
	Pick a closed Polyline to import tiles defined like a Crossing Window selection set.
Window select	Pick two points to define a rectangular coverage area to import.

Tile frame utilities

To help with the transition from Land-Line data in tiles these utilities are included :-

Draw from chunk extents

Purpose

To draw annotated 1:2500 tiles within .gml file extents. Note that this works by only reading file header information and the data will extend beyond this (like a CAD crossing window selection set).

Operation

Select one .gml file

↵ to accept default layer for drawing tiles on or enter alternative.

Draw from reference

Purpose

To draw one 1:1250 or 1:2500 tile from its reference (e.g. SU6053).

Operation

Enter the tile reference

↵ to accept default layer for drawing tiles on or enter alternative.

Draw from picked extents

Purpose

To draw all Tiles within a defined area. These may be standard 1:1250 or 1:2500 OS tiles or user defined sizes ranging from 50 to 10000 metres. These tiles are drawn as closed 2D Polylines and their main purpose is to provide the locations for batch mode operation.

Operation

Enter 1 for 1:1250, 2 for 1:2500 or 3 for user defined tile size.

↵ to accept default layer for drawing tiles on or enter alternative.

Pick bottom left hand corner of area

Pick top right hand corner of area

If option 3 is selected enter the size of tile and a prefix for the reference.

Attached data utilities

Show attached data

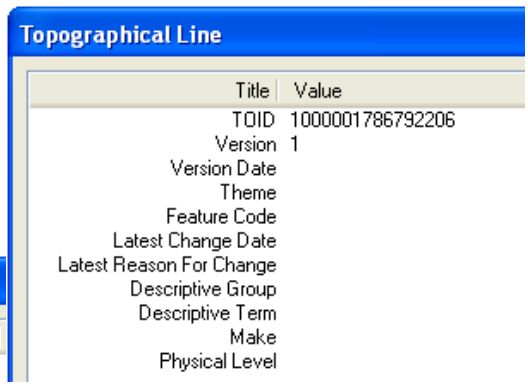
Purpose

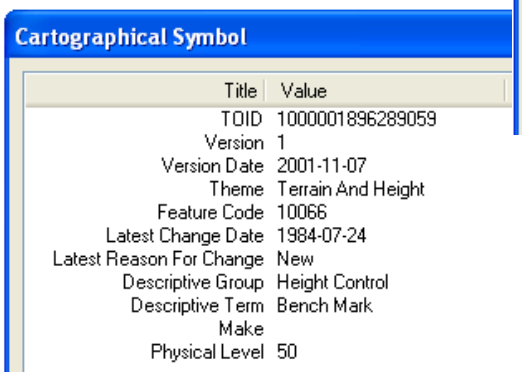
To display the "attribute data" held as Xdata. This may be TOID and Version only or full attributions that will increase the size of the drawing.

Operation

Pick an entity

TOID only





Full attribution

Report/Remove identical TOIDs

Purpose
To find any occurrence within the drawing of a TOID being repeated. This can happen when neighboring chunks of data have been input with separate use of menu item *Import OS MasterMap into CAD*. These "repeated" entities need to be removed to ensure drawing integrity.

Operation
Make a selection set for "all". Choose if repeated entities are to be erased or sent to a named layer.

Locate by TOID

Purpose
To find an entity by its TOID

Operation
Enter full TOID or part
□ Zoom when found "On" to zoom around located entity
□ Partial match OK "On" if not searching on the full TOID
Click on the *Locate* button and make a selection set to find the TOID

Report Areas

Purpose
To report the area from the "attribution" Xdata from one or more entities. Note that area information will only be available if polygon features have been imported into the drawing as polylines with full attribution data.

Operation
Select one or more 2D polylines to see the total area.

Annotated Grid

Purpose
To draw annotated co-ordinate grid located by an existing "L shaped" polyline.

Operation
↵ to accept default layer for drawing the grid on.
Pick top left, bottom left and bottom right corners (object snap is automatic).
↵ to accept default grid interval or enter alternative. Choose lines or crosses.
↵ to accept default nominal scale.

Licence configuration

Displays KeyGML licence / dongle information.

KeyGML Help

Invokes the on screen help system.

Additional notes on advanced filtering options

Data can be further filtered by using "Exceptions". For example under feature code 10019 (Building outline) there is a possibility that the line is overhead. As normally overhead features are drawn with a different linetype this is a good example of an exception (to the normal rule). Toggle "Use exceptions" "on" and go to "Details…". Add a statement by clicking the "Add…" button, in this case you would select "PhysicalPresence is Overhead". Then define the layer, colour etc. for this exception.

KeyGML Q and A

What is OS MasterMap ?

The Ordnance Survey now provide the definitive digital map of Great Britain as their OS MasterMap product. This seamless database reflects the real world with themed feature layers, polygon data and the important TOID (unique Topographic Identifier for every feature).

How is the data supplied ?

OS MasterMap is only supplied as .gz files that when unzipped become .gml (Geography Mark-up Language) files. Latest updates are available as change only files. Note that .gml files can be very large indeed. KeyGML will directly read the compressed .gz files.

How do I read OS MasterMap into CAD ?

KeyGML has been developed by KeyTERRA-FIRMA Ltd. to read OS MasterMap .gml files and provide a structured, selective and intelligent input to CAD.

What is KeyGML ?

KeyGML is CAD application software that works within the AutoCAD 2007 and later platforms or Bricscad to read OS MasterMap files and to draw the mapping data within the CAD drawing.

What are the main features of KeyGML ?

- One or a number of files (chunks) may be selected for multiple input.
- Removal of identical TOIDS (note that features crossing the edge of a chunk are not “trimmed” and will be in more than one adjoining .gml file).
- Polygons from independent and topological data represented as closed polylines or solid hatch.
- OS feature codes to CAD layers and blocks (symbols) by user controlled settings.
- Input by specified themes and groups.
- Extract from the file(s) only areas of interest defined by polygons or buffers to help manage the CAD drawing size.
- TOID recognition (and other attribute data such as areas)
- Change only update file input.
- Link to ADDRESS-POINT (e.g. extract area of interest defined by post code)
- Tools to help with the transition from Land-Line tile based data.
- Automatic writing of traditional 1:1250 and 1:2500 tiles.
- Printed manual and on-line help system.
- Standalone and Network (NLM) versions of KeyGML are available.

How long will KeyGML take to read my OS MasterMap files ?

Bearing in mind the size of some .gml files the following will give an idea of performance :-

Very modest P4, 2GHz, 512 Mb. RAM, Windows XP.
102 Mb file takes 1 minute to read and 2¾ minutes to create a 10 Mb CAD “Land-Line type” drawing.

Note that the intention is not to create large CAD drawings as KeyGML enables input selection by area(s) of interest and features only or batch output of traditional tiles.

Are there any other technical considerations ?

Yes - here are some additional points :-

- 2.5 Gb. files are readable (there is no absolute maximum size) however independent polygon data in chunk sizes around 100 Mb. is recommended when ordering OS MasterMap data to help with efficient input to CAD.
- Following a very simple installation routine KeyGML may be run from its own desktop shortcut. The program directory is added to the CAD Support File Shortcut Path and the KeyGML menu loaded.