

# Advanced GEM80 Programmer – Version 4.0

## Product Overview



This latest update of the Advanced GEM80 Programmer was initially planned to correct any reported bugs. However, In addition a number of other changes have been made to allow reliable installation and operation on the latest Windows 7 and Windows 8 operating system.

We are also offering existing users the option to upgrade any existing software version to V4.x and also the opportunity to upgrade their old parallel or early USB dongles to the latest Hasp-HL USB dongles for easy compatibility with newer machines and operating systems.

The major changes are shown below:-

- Communications changes
- Extended Desktop facilities for larger monitors
- Rung editor address search/replace options extended

To use AGP V4.0 on Windows 7 – Professional requires no special install. However, if using Windows 7 – Home premium on some machines the software must be installed differently. However, this is an easy task as the AGP does not need any special registry entries for successful operation, and is fully detailed in the installation notes.

For users of any AGP prior to Version 3.55 or the now-withdrawn standard version the details below show the full range of facilities in V4.x.

## Advanced GEM80 Programmer

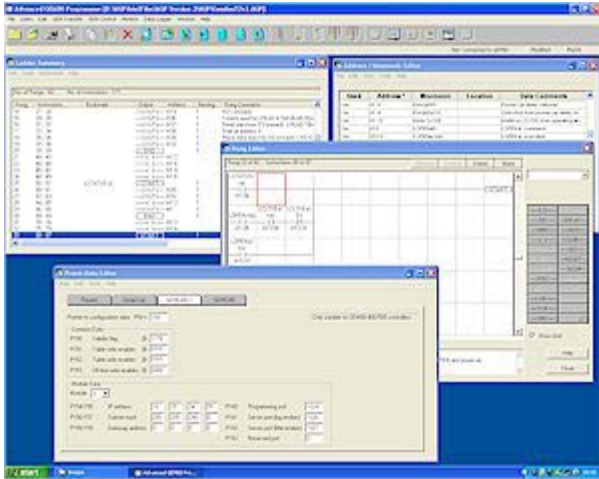
The Advanced GEM80 Programmer is the latest application in a range of Gem80 programming tools from Advanced Technical Software.

Developed in conjunction with Converteam, the Advanced GEM80 Programmer has been designed to replace the aging UGP, Gemesys and GPP programming packages, which no longer work on the latest Windows operating systems. It can also convert program files created on the Systems Programmings (Yellow Box)



### Version 3 & 4

Versions 3.x and 4.0 of the Advanced GEM80 Programmer offer a wide range of powerful new features to make programming and maintaining your GEM80 programs even easier.



The Advanced GEM80 Programmer is the latest generation of programming packages for the GEM80 range of PLCs.

The package itself provides extensive facilities for developing, documenting, testing and maintaining your applications.

Some of these facilities are described in more detail on the following pages.

**Whether developing a new system, upgrading an old one or fault finding, the Advanced GEM80 Programmer will meet your expectations.**

## **A Range of Powerful Features**

Version 4.0 of the Advanced GEM80 Programmer offers a range of powerful features to help you write and maintain your GEM80 logic. Following are just some of the features the Advanced GEM80 Programmer has to offer.

### **Main Interface**

- The main user interface has been considerably redesigned and improved. This together with changes to the way windows such as the Mnemonic Editor, Data Table Editor etc. look and work as made the Advanced GEM80 Programmer now even easier to use.
- It is also possible to run multiple copies of the AGP at the same time.
- Right hand mouse support has now been added to many of the windows.

### **Compare Facilities**

- There are two comparison facilities, a standard compare facility that indicates what has been compared and whether or not there were any differences. If there were differences found, then the first 10 of these in each section – logic, presets, addresses, data comments, rung comments, will be displayed.
- The enhanced File Compare facility lets you compare the program loaded into the AGP with another program stored on disk. You can view both sets of rungs, p-tables and mnemonics simultaneously, with differences being automatically highlighted.

### **Off-line RAM**

- Ability to transfer off-line RAM files from GEM and save them to disk and vice-versa. Also provided is the ability to compare the off-line RAM in the GEM80 with previously saved RAM files to see if they are the same or not.

### **Program EPROM**

- Ability to blow the program in RAM on the GEM80 to the EPROM chip (if installed) on the GEM80. Also offers the ability to switch between running the program in the RAM of the GEM80 or the EPROM.

### **Table Monitor**

- This is displayed as a grid (similar to MS Excel). There can be 5 grids accessed via a series of tabs. Each grid can monitor up to 32 different tables within the GEM80.
- Each tab can be given a description and the entire layout saved to disk and reloaded at a later time.
- This window is fully re-sizable and allows items to be added / deleted even whilst monitoring.

### **Diagnostics Monitor**

- This is a sizable, tabbed window displaying the following diagnostics information as supplied by the GEM80:
  - PLC info (F0 to F9)
  - I/O info (whether I/O has failed or is in fault condition)
  - Serial Link info (status of serial link – dependent on how it is configured) – (GEM80-400/500 only)
  - GEMCAN info (status of GEMCAN) – (GEM80-400/500 only)

## Test Panel

- This facility is similar to the Table Monitor, however, it is more versatile especially when testing programs. Basically it comprises of five 3x16 grids of cells. Like the Table Monitor, each tab can be given a description and the entire layout saved to disk and reloaded at a later time. Each cell can be one of the following:
  - Empty: nothing appears in it
  - Switch: a switch is displayed – this is used to force a digital value on/off in the GEM80
  - Lamp: a lamp is displayed – this is used to indicated whether a digital value is on/off
  - Numeric Entry: this displays an analogue value, this value can also be forced in the GEM80
  - Descriptive Text: this can be any user entered text and is used to clarify the test panel layout

## Data Logger

- This facility allows a different way to monitor tables within the GEM80, furthermore this data can be saved to disk and subsequently converted to a CSV file which can then be read in any analysed or stored by any other program capable of reading CSV files.
- The Data Logger Configuration window allows you to set-up what addresses to log (up to a maximum of 24). Specify when the logging will take place (at regular intervals, between certain times, on certain events or a combination of these). It also allows you to specify whether the data will be logged to file, how large the file can grow and what should happen when the file size is reached. All this information is stored with the current project file.
- The Data Logger Viewer shows the actual data being logged. This can be viewed in a tabular format or in a graphical format (this will be a line graph for analogue items and a bit trace for digital items). The viewing of the data can be paused and resumed without affecting the logging of the data to file.

## Ladder Summary

- This is a sizable window with its own menu and a range of special features and facilities.
- It is possible to export a range of rungs to disk and then import them into the same program or other programs (all corresponding addresses, mnemonics etc. are also exported / imported with them). Thus it is now possible to build up a series of library routines that can quickly be pulled into a new project.
- There is also the ability to add up to 32 bookmarks (one per rung) and quickly go to any bookmark. Bookmarks each have a unique piece of user-entered text to identify them.

## Address / Mnemonic Editor

- A range of powerful tools allow you to:
  - **Change a Range of Addresses**  
e.g. change all addresses in the range A2 ... A9 to G2 ... G9. It is also possible to move any associated mnemonics etc. with the addresses if desired.
  - **Verify Addresses**  
This facility works through the program logic and checks that all the addresses used in the program also exist in the mnemonics list. If they don't then they are added and the user is informed of these new addresses.
  - **Find and Replace Text**  
This is a simple find and replace text facility and allows a specified piece of text to be searched for and subsequently replaced in the Mnemonic, Location and Data Comments fields.
  - **Delete all Unused Addresses**  
Deletes all addresses that are marked as not used in the program logic and that don't have an associated mnemonic.

## Preset Data Editor

- This is displayed as a tabbed window. The five tabs are:
  - **Presets**  
This uses an MS Excel like grid to display and enter the data. All fields can be edited by highlighting the field and editing in place. Some fields may cause another dialog box to be displayed to allow the user to enter the data in the correct format. It is now also possible to copy and paste a range of p tables.
  - **Serial Link 4/500**  
This provides an easy to use method of setting up the p tables for configuring one or more of the serial ports (GEM80-400/500 only).
  - **Serial Link 16-bit**  
This provides an easy to use method of setting up the p tables for configuring one or more of the serial ports (GEM80 140, 150, 160, 250, 300, 310 and 350 PLCs only).
  - **GEMLAN-T**  
This provides an easy to use method of setting up the p tables for configuring the GEMLAN-T module (GEM80-400/500 only).
  - **GEMCAN**  
This provides an easy to use method of setting up the p tables for configuring the GEMCAN module (GEM80-400/500 only).
- The Tools menu also allows the following features:
  - Clear a Range of Tables
  - Fill a Range of Tables
  - Insert and Expand Tables
  - Delete and Condense Tables
  - Export a Range of Tables to Disk
  - Import a Range of Tables from Disk

## Off-line Message Editor

- An off-line message editor facility allows the user to view and edit messages stored in the p tables in a user-friendlier manner. This feature is not available when connected to the GEM80 in dual edit mode.
- A list of all the messages in the program is displayed, it is then possible to add new messages, edit or delete existing ones. The main method of entering messages is via a standard Windows text entry field, additional controls allow the user to easily enter special characters or numeric formats.

## Ladder Summary

The Ladder Summary window is displayed as soon as you start the Advanced GEM80 Programmer, initially it will be empty until you either load in an existing project, start creating a new one or download a program from the GEM80.

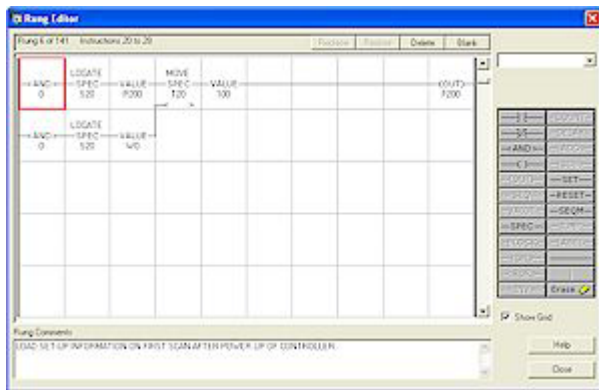
The title bar indicates whether or not it is in dual-edit mode and the current connection the AGP is using to communicate with the GEM80. Underneath the menu bar for this window is displayed the number of rungs and instructions in the ladder logic.

Below this is a list of all the rungs in the project divided into a number of columns, indicating the actual rung number, the instructions within the rung, any bookmarks, the output symbol and address for that rung, block numbers and the level of nesting and finally any comments associated with the rung.

Rung	Instructions	Bookmark	Output	Address	Nesting	Rung Comments
1	0-1	Power Up	→(OUT)→	H1.1	1	Power up block
2	2-5		→(OUT)→	H210	1	Control system memory map "G-Tables - d
3	5-6		→(OUT)→	H210	1	End Power Up block
4	7-8	File Complete	→(OUT)→	H11	1	File Complete block
5	9-12		→(OUT)→	H11	1	Control word for LSPEN a "SEMPLAN" inc
6	11-12		→(OUT)→	H14	1	Control word for LCLOSE a "SEMPLAN" inc
7	13-14		→(OUT)→	H29	1	Control word for LREAD a "SEMPLAN" inc
8	15-16		→(OUT)→	H30	1	Read data from I/O onwards: LREAD "G-
9	17-18		→(OUT)→	H31	1	Start at address 0
10	19-20		→(OUT)→	H32	1	Place data read into GO onwards: LREAD
11	21-22		→(OUT)→	H33	1	Start at address 0
12	23-24		→(OUT)→	H37	1	Control word for LSTATUS a "SEMPLAN" Ma
13	25-26		→(OUT)→	H45	1	Result area LSTATUS a for Channel 1 "S
14	27-28		→(OUT)→	H49	1	H49 onwards
15	29-30		→(OUT)→	H36	1	Control word for LREAD b "SEMPLAN" inc
16	31-32		→(OUT)→	H37	1	Read data from I/O onwards: LREAD "G-
17	33-34		→(OUT)→	H30	1	Start at address 0
18	35-36		→(OUT)→	H39	1	Place data read into GO onwards: LREAD
19	37-38		→(OUT)→	H33	1	Start at address 0
20	39-39		→(OUT)→	H37	1	End File Complete block
21	40-43		→(OUT)→	H1.7	1	Set flag when a delay at powerup "Delay I
22	44-48		→(OUT)→	H1.5	1	Create a latch that power up has taken of
23	49-47		→(OUT)→	H1.3	1	After a delay create a one-shot that powe
24	48-49		→(OUT)→	H1.3	1	Followed by above
25	50-57	LSTATUS a	→(OUT)→	H1.5	1	LSTATUS a for Channel 1 "Operator # I
26	58-61		→(OUT)→	H20	1	LSTATUS a Channel 1
27	62-63		→(OUT)→	H16	1	Reset LSTATUS a Transaction Status
28	64-65		→(OUT)→	H1.2	1	LSTATUS a has been operated flag

## Rung Editor

The Rung Editor window is normally displayed as a result of adding / inserting or editing a rung in the Ladder Summary.



The title bar of this window indicates whether or not it is in dual-edit mode and the current connection that the AGP is using to communicate with the GEM80. Below this is displayed the number of the rung being edited (if applicable) and the instructions within the rung. To the right of this are four buttons to allow you to store/replace the rung, restore the rung to what it was before any changes were made, to delete the rung and to create a new blank rung.

The main part of the window shows a 10x5 grid that allows you to build up a rung, the grid can be toggled on and off by clicking on the Show Grid check box. Below the main edit area of the Rung Editor window is a text entry box to allow you to enter any comments to associate with the rung.

## Help on Special Functions - When you need it

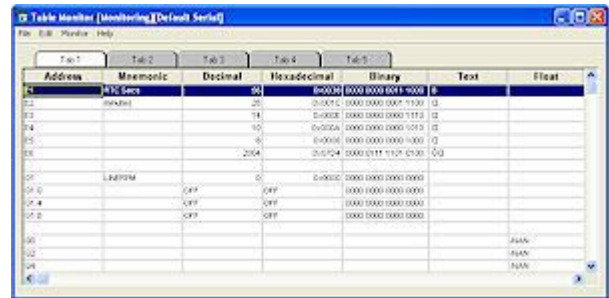
If you right click on a cell containing an address whilst holding the Ctrl key down, if that address has an associated mnemonic and / or data comment then it will be displayed in a small pop-up window underneath the cell, when the right mouse button is released, the data comment window will be removed. If the address is a special function then the relevant help topic for that special function will be displayed. You can now also monitor the Zm tables associated with special functions.

## Table Monitor

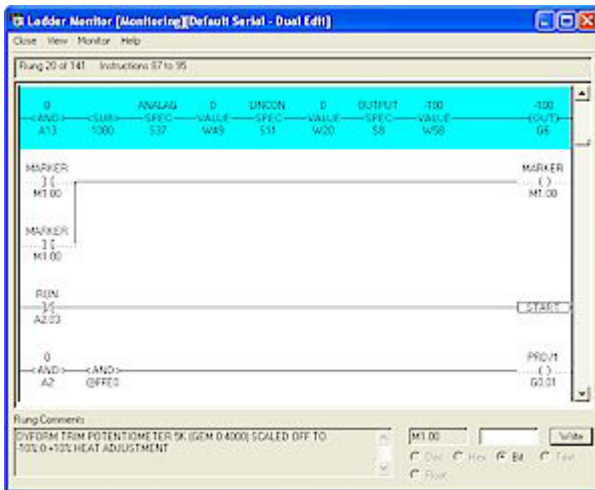
The Table Monitor lets you monitor and force values for any table within the GEM80. The title bar of this window indicates whether or not it is currently monitoring the GEM80, whether or not it is in dual-edit mode and the current connection that the AGP is using to communicate with the GEM80. Below this is the menu bar associated with this window.

The main part of the window shows the tables being monitored. All of the fields within the grid can be edited by highlighting the desired cell and typing the new information.

By entering values into the Address or Mnemonic fields it is possible to add a new table to monitor to the existing information.



When monitoring, entering a value into the Decimal, Hexadecimal, Text and Float fields will force that value to be written to the appropriate table within the GEM.



## Ladder Monitor

The Ladder Monitor allows you to monitor one or more ladder rungs in the GEM80.

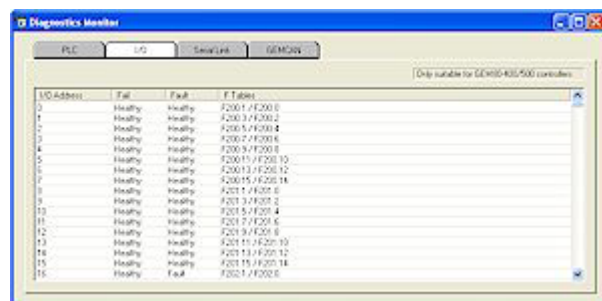
The main part of the window shows the rungs being monitored, if in dual-edit mode multiple rungs are displayed, if connected directly to the GEM80 and not in dual-edit mode then only one rung is shown. Above the actual rung(s) is displayed the rung number and instructions within that rung, if not in dual-edit, then just the instruction within the rung are displayed.

Below this are any rung comments associated with the highlighted rung and a number of controls that allow you to write a new value into an address within one of the rungs.

## Diagnostics Monitor

The Diagnostics Monitor is a sizable, tabbed window displaying the following diagnostics information as supplied by the GEM80:

- PLC info (F0 to F9)
- I/O info (whether I/O has failed or is in fault)
- Serial Link info (status of serial link – dependent on how it is configured)
- GEMCAN info (status of GEMCAN)

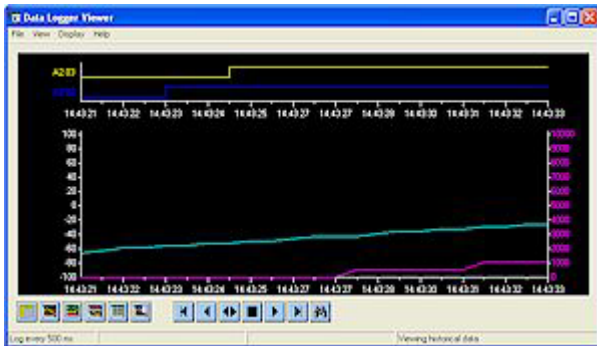
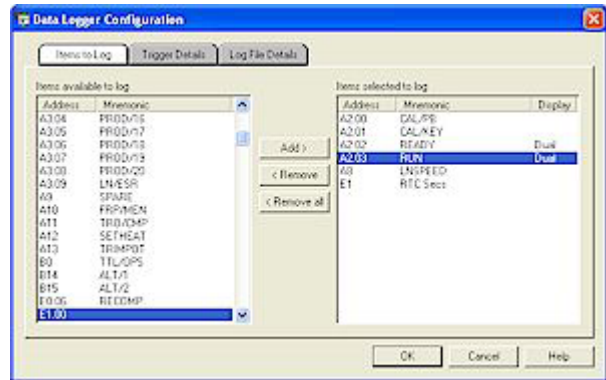


Detailed information on what the Diagnostics Monitor shows can be found in the on-line help.

## Data Logger

This facility allows a different way to monitor tables within the GEM80, furthermore this data can be saved to disk and subsequently converted to a CSV file, which can then be read in and analysed or stored by any other program capable of reading CSV files.

The Data Logger Configuration window allows you to set-up what addresses to log (up to a maximum of 24). Specify when the logging will take place (at regular intervals, between certain times, on certain events or a combination of these). It also allows you to specify whether the data will be logged to file, how large the file can grow and what should happen when the file size is reached. All this information is stored with the current project file.



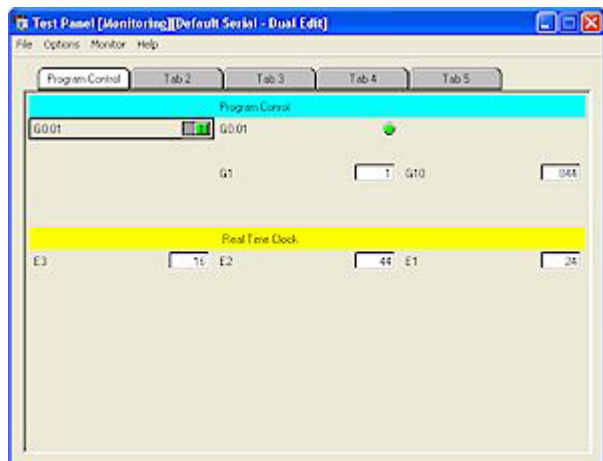
The Data Logger Viewer shows the actual data being logged. This can be viewed in a tabular format or in a graphical format (this will be a line graph for analogue items and a bit trace for digital items). The viewing of the data can be paused and resumed without affecting the logging of the data to file.

## Test Panel

This facility is similar to the Table Monitor, however, it is probably more versatile especially when testing programs. Basically it comprises of five 3x16 grids of cells. Like the Table Monitor, each tab can be given a description and the entire layout saved to disk and reloaded at a later time.

Each cell can be one of the following:

- Empty: nothing appears in it
- Switch: a switch is displayed – this is used to force a digital value on/off in the GEM80
- Lamp: a lamp is displayed – this is used to indicated whether a digital value is on/off
- Numeric Entry: this displays an analogue value, this value can also be forced in the GEM80
- Descriptive Text: this can be any user entered text and is used to clarify the test panel layout





## A host of useful tools

The Advanced GEM80 Programmer comes supplied with a host of useful tools and facilities to make programming and maintaining your GEM programs even easier. Below are just a few of them:

### Ladder Summary

#### • Bookmarks

Add, delete and go to (up to 32) bookmarks.

#### • Export / Import Rungs

It is now possible to export a range of rungs to disk and then import them into the same program or other programs (all corresponding addresses, mnemonics etc are also exported / imported with them). Thus it is now possible to build up a series of library routines that can quickly be pulled into a new project.

### Mnemonic Editor

#### • Export mnemonics to disk as CSV file

#### • Import mnemonics from disk as CSV file

Allows transfer of mnemonics between AGP and SCADA / other third party applications.

#### • Change a range of addresses

e.g. change all address in the range A2 ... A9 to G2 ... G9. It is also possible to move any associated mnemonics etc. with the addresses if desired.

#### • Verify addresses

This facility works through the program logic and checks that all the addresses used in the program also exist in the mnemonics list. If they don't then they are added and the user is informed of these new addresses.

#### • Find and replace text

This is a simple find and replace text facility and allows a specified piece of text to be searched for and subsequently replaced in the Mnemonic, Location and Data Comments fields.

#### • Delete all unused addresses

Deletes all addresses that are marked as not used in the program logic and that don't have an associated mnemonic.

### Preset Data Table Editor

#### • Easy set-up of GEMLAN-T module

This provides an easy to use method of setting up the p tables for configuring the GEMLAN-T module (GEM80-400/500 only).

#### • Easy set-up of GEMCAN module

This provides an easy to use method of setting up the p tables for configuring the GEMCAN module (GEM80-400/500 only).

#### • Copy a range of p tables

#### • Paste a range of p tables

#### • Fill a range of p tables

#### • Insert and expand tables

#### • Delete and condense p tables

#### • Export a range of p tables to disk

#### • Import a range of p tables from disk

Additional tools that provide facilities similar to the ATS GEM80 Toolbox for manipulating p tables.

## Test Panel

This facility is similar to the Table Monitor, however, it is probably more versatile especially when testing programs. Basically it comprises of five 3x16 grids of cells. Like the Table Monitor, each tab can be given a description and the entire layout saved to disk and re-loaded at a later time. Each cell can be one of the following:

- **Empty:** nothing appears in it
- **Switch:** a switch is displayed – this is used to force a digital value on/off in the GEM80
- **Lamp:** a lamp is displayed – this is used to indicated whether a digital value is on/off
- **Numeric Entry:** this displays an analogue value, this value can also be forced in the GEM80
- **Descriptive Text:** this can be any user entered text and is used to clarify the test panel layout

## Additional Connections to GEM80

- **GEMLAN-T**
- **GEMTALK**
- **eWON Serial-Ethernet Bridge**

The AGP offers the ability to communication to a suitable GEM80 via the GEMLAN-T module giving increased performance.

GEMTALK and eWON Serial-Ethernet Bridge protocols are also available, however, this is a chargeable extra available from ATS.

## Import Facilities

### ● **Import CSV files**

The AGPB can import files form the ATS Emulator / UGP and Alstom's Gemesys / GPP and CSV files.

### ● **Import from System Programmer**

Version 4.0 of the AGP can also import System Programmer files.

The System Programmer to AGP conversion facility is designed to convert the ladder diagram program and associated documentation (Rung Comments, Mnemonics and Data Comments) from the system programmer to AGP via the serial link.

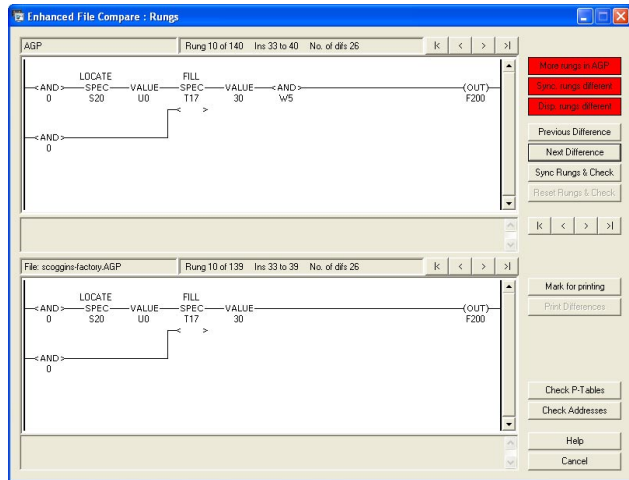
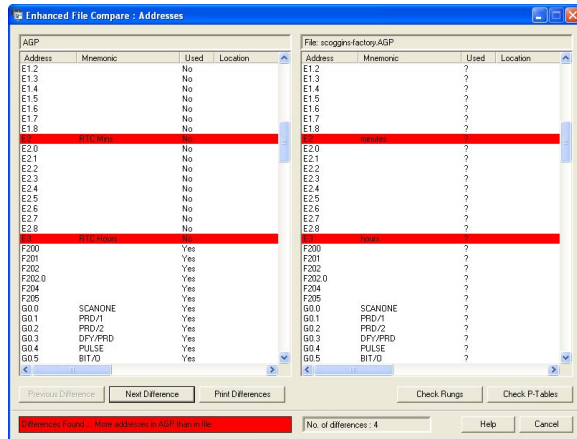
Copies of the programs, in AGP format, from the following devices should be obtained by attaching the AGP to the device and saving the program in the normal way.

- Imagem
- Programmable Serial Communications
- Data Tables
- Offline RAM

## Enhanced Compare Facilities

### Enhanced File Comparison

The Enhanced File Comparison allows you to perform an in-depth comparison between the project currently in the AGP and a file stored on disk. The Enhanced File Comparison compares the project logic (instructions and rung comments), P tables and finally the Addresses (and associated documentation – mnemonics, data comments etc.).



## Rung Overview

Display multiple consecutive rungs in the same window (space permitting), double clicking on selected rung invokes Rung Editor.

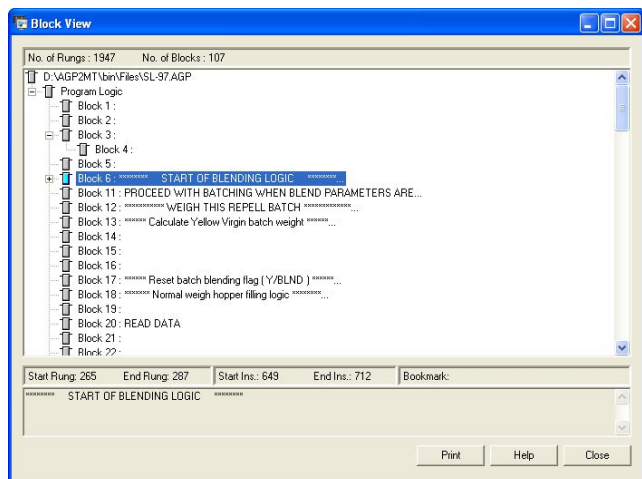
## Block View

The Block View displays an outline of the currently loaded program in the AGP as a hierarchical tree of program blocks, similar to the way the Windows Explorer display the directory structure of the computer's disk drive.

This window displays the number of rungs and number of blocks contained with the current program. Each block is numbered and alongside it is displayed part of any rung comments associated with it.

A block with a "-" in a small square to the left of it means that the block can be collapsed by clicking on the "-" symbol, a block with a "+" in a small square to the left of it means that the block can be expanded (showing other blocks nested within the selected block) by clicking on the "+" symbol.

Double clicking on a block will cause the rung containing the START block instruction for that block to be highlighted in the Ladder Summary.

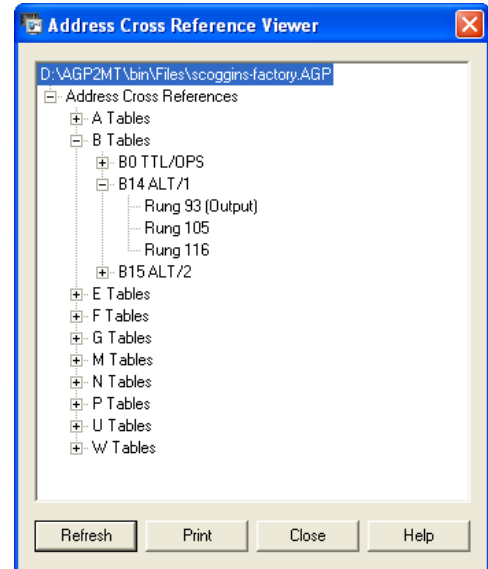


## Address Cross Reference

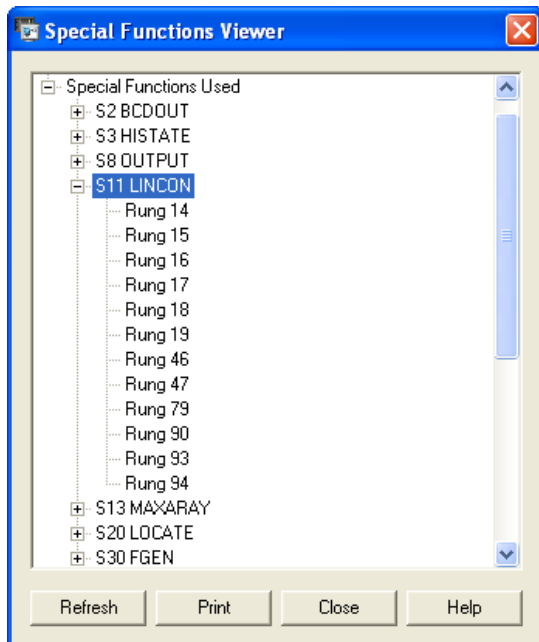
The Address Cross Reference Viewer displays a list of all the address used in the currently loaded program in the AGP as a hierarchical tree, similar to the way the Windows Explorer display the directory structure of the computer's disk drive. Double clicking on a rung number will cause that rung to be highlighted in the Ladder Summary.

As can be seen from the picture opposite, the Address Cross Reference Viewer breaks the address information down as follows:

- A list of all the tables used.
  - A list of all the addresses used along with any associated mnemonic within that table group.
    - A list of all the rung numbers where that address is used, if the address is used as an output in that rung, then this is also indicated.



## Special Functions Used



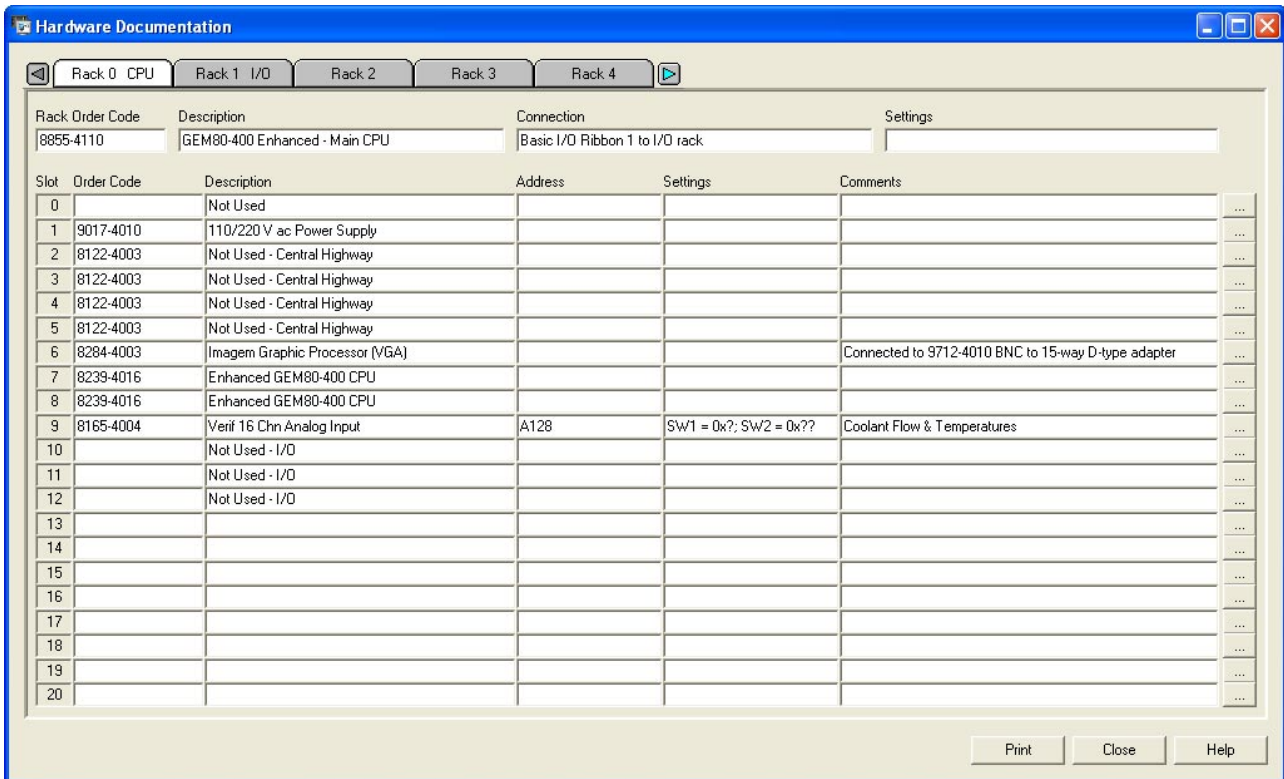
The Used Special Functions displays a list of all the special functions used in the currently loaded program in the AGP as a hierarchical tree, similar to the way the Windows Explorer display the directory structure of the computer's disk drive.

If you press the F1 key whilst a special function is highlighted it will cause the on-line help information for that special function to be displayed.

Double clicking on a rung number will cause that rung to be highlighted in the Ladder Summary.

## Hardware Documentation / Rack Layout

The hardware documentation facility allows you to associate documentation applicable to your hardware set-up with the project.



## Data Logger

This facility allows a different way to monitor tables within the GEM80, furthermore this data can be saved to disk and subsequently converted to a CSV file, which can then be read in and analysed or stored by any other program capable of reading CSV files.

The Data Logger Configuration window allows you to set-up what addresses to log (up to a maximum of 16). Specify when the logging will take place (at regular intervals, between certain times, on certain events or a combination of these). It also allows you to specify whether the data will be logged to file, how large the file can grow and what should happen when the file size is reached. All this information is stored with the current project file.

The Data Logger Viewer shows the actual data being logged. This can be viewed in a tabular format or in a graphical format (this will be a line graph for analogue items and a bit trace for digital items). The viewing of the data can be paused and resumed without affecting the logging of the data to file.

## System Requirements

In order to use the Advanced GEM80 Programmer, you will need the following:

- A Pentium III - 600 MHz (or better) computer with a hard disk and a CD ROM drive.
- At least 64MB of RAM.
- A SVGA monitor configured for a screen resolution of 1024x768 pixels or greater. The Advanced GEM80 Programmer is not designed to run under lower resolutions.
- A copy of Microsoft Windows 2000, Windows XP, Windows Vista or Windows 7. The Advanced GEM80 Programmer is a true 32 bit application and will only run under the above operating systems.
- A mouse or other Windows compatible pointing device.
- At least 8MB of free hard disk space for the program files plus additional free disk space for any files you create whilst running the Advanced GEM80 Programmer.
- A free serial communications port or USB port in order to communicate to a GEM80 PLC and a serial communications cable to connect the computer to the PLC, or an Ethernet card and the appropriate cable if connecting using GEMLAN-T or the Serial-Ethernet Bridge.
- A parallel or USB port to connect your software activation key (SAK) to. The Advanced GEM80 Programmer is a protected application and will not run without the correct SAK fitted.

These are the recommended minimum requirements. Obviously the more power your computer has the better will be the performance of the Advanced GEM80 Programmer.

## Distribution and Pricing

The Advanced GEM80 Programmer is supplied on CD along with a software activation key (SAK), programming cable and comprehensive on-line help.

The cable supplied as standard is a RS232-RS232 programming lead suitable only for the latest GEM80 processors (131, 400 and 500). All other GEM80 processors, Imagem etc. require a 20mA connection. If you need such a cable, please contact ATS for pricing.

AGP4.0 - Developer Pro	£1650.00
Upgrade AGP v3.55 Developer Pro to AGP4.0 - Developer Pro*	£375.00
Upgrade AGP v1.x, 2.x Developer Pro to AGP4.0 - Developer Pro*	£500.00
Upgrade AGP v1.x, 2.x, 3.x Standard to AGP4.0 - Developer Pro*	£750.00
Exchange Parallel or old style USB Dongle to Latest Hasp-HL USB **	£150.00
<b>REPLACEMENT DONGLES</b>	
Lost Dongles Will Only Be Replaced At The Full Package Cost	£1650.00

\* Some software upgrades will need a dongle exchange

\*\* This can only be undertaken at the same time as a software upgrade.

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