



# AUTOMATION ACADEMY

## GEM 80 PLC Systems PDF Library

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### GEM 80 PLC Systems and Automation Academy

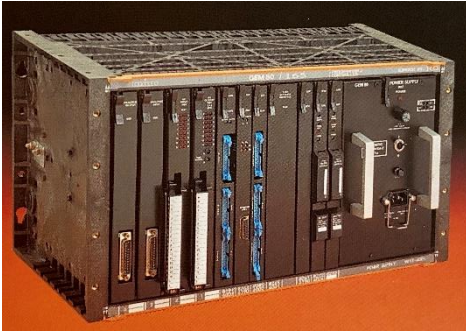
Here at Automation Academy we are passionate about all PLC systems, we do however have a special affinity for GEM 80 controllers. Our Senior Instructor worked at GEC Industrial Controls, Kidsgrove the home of GEM 80 within the Customer Training Department. This was during the height of GEM 80 systems development when PLC systems were rapidly developing. As a company Automation Academy draws on these 34 years of experience in GEM 80 training to provide the most comprehensive GEM 80 training courses available. Using the Advanced Technical Software developed AGP GEM 80 Windows programming package we can deliver our GEM 80 PLC systems training at your site with full hands on practical GEM 80 training courses.

As well as our GEM 80 training courses because of our expertise and our historical links back to GEM 80 systems we also get many requests for GEM 80 technical information. With this in mind we want to share our knowledge and appreciation of these systems we have made available our collection of GEM 80 technical manuals in pdf format for you here. If there is any information that you require that is not on our website then we may have a copy in printed form, please contact us and we will see what we can find for you. We are always more than happy to help support the GEM 80 family.

<https://www.automation-academy.uk> or email [info@autoac.uk](mailto:info@autoac.uk), we will be happy to help you.

## GEM 80 PLC Systems and Programming Devices.

The GEM 80 range of programmable logic controllers began their life in the late 1970's, as a development of GEC Industrial Controls at Kidsgrove, Stoke on Trent and GEC Projects at Rugby. It quickly took off and by the mid 1980's GEM 80 had approximately a 25% share of the UK's fledgling automation industry. Large companies such as Shell, Texaco, Ford, British Steel and Cadburys signed up to the GEM 80 as the controller of choice. These were alongside utility companies, power stations and water companies that also decided to opt for GEM 80 during this 1980's automation revolution. GEM 80 flourished not only in the UK but also worldwide through a network of GEC owned subsidiaries. Installations were made in the automotive, oil and gas, mining, steel production and food facilities all around the world.



Into the 1990's the GEM 80 range continued in its development of new features such as floating-point maths, integration with hard disk off line storage and Ethernet communication options to name a few. These newer GEM 80 systems adopted the same operating systems, communications and I/O structures as the earlier GEM 80 systems, this led to easy upgrade options and interoperability of both the old and new systems working together.

### Backwards Compatibility.

All GEM 80 controllers that were produced were exceptionally good in terms of backwards compatibility with the older models they were designed to replace. These new systems required very few software modifications to allow an early 1980's GEM 80 ladder program to run on the latest GEM 80 controllers. Because of this compatibility as the GEM 80 systems reached the end of their development in 1993 with the modular GEM 80 400 controller and 2002 with the all in one GEM 80 500 controller. Many of the earlier GEM 80 systems were upgraded to one of these two types of GEM 80.

### Company Name Changes.

All of the way through the GEM 80 development and production time line the company producing the GEM 80 took on many different names as the Kidsgrove factory producing the GEM 80 controllers was sold on to various major players in the automation and control marketplace.

GEC Industrial Controls originally launched the GEM 80 in 1979. Then in 1989 GEC Industrial Controls became CEGELEC. In 1999 CEGELEC becomes part of Alstom Power Conversion. Then in 2006 The ALSTOM Power Conversion group was sold off from Alstom to become an independent business called Converteam. In 2011 Converteam was bought by GE Energy and was then re-branded GE Power Conversion in 2012. In March 2017 GE Power Conversion closed the "GEM 80 factory" at Kidsgrove.



## GEM 80 Controllers.

The list below shows GEM 80 controller model numbers and the approximate years of their main production. (Note \* all production date ranges are approximate.)

### **GEM 80 8-Bit Controllers 1979-82\***

100 SERIES (100,130) Basic I/O.

200 SERIES (210,220,230,225,235,245) Basic I/O & Fast I/O.

### **GEM 80 16-Bit Controllers 1982-86\***

140 SERIES (140,141,142) Basic I/O, Concentrated I/O.

250 SERIES (251,252,253) Basic I/O, Fast I/O.

300 SERIES (301,302,303) Basic I/O, Concentrated I/O, Fast I/O.

350 SERIES (351,352,353) Basic I/O, Concentrated I/O, Fast I/O.

700 SERIES (701,702,703) Basic I/O, Concentrated I/O, Fast I/O.

### **GEM 80 16-Bit Controllers 1986-90\***

131 SERIES (131) Basic I/O.

160 SERIES (163,164,165,166) Basic I/O, Verification I/O.

310 SERIES (311,312,313) Basic I/O, Verification I/O, Fast I/O.

730 SERIES (734) Basic I/O, Verification I/O, Fast I/O.

MULTIGEM (Rugby) (M Series) Basic I/O, Verification I/O, Fast I/O.

### **GEM 80 16-Bit Controllers 1993-2017\***

400 SERIES (Standard, Enhanced) Basic I/O, Verification I/O, Fast I/O.

400 SERIES VME Basic I/O, Verification I/O.

500 SERIES Basic I/O, Verification I/O.

510 SERIES Basic I/O, Verification I/O.

## GEM 80 Programming Devices and Software.

There have been a total of 8 different GEM 80 programming devices or software packages produced over the years that allow for the programming and monitoring of all GEM 80 controllers. All of the programming units/software will connect to any of the range of GEM 80 controllers. Although an RS232 to 20mA conversion lead may be required for PC based programmer operation to connect to older controllers (Pre GEM 80 131 controllers).

### GEM 80 Portable Programmer.

The original GEM 80 programming unit was not particularly portable! You also needed a cassette tape recorder and a DIN lead to load, store (record) and verify your GEM 80 programs.

### GEM 80 System Programmer.

Introduced in the mid 80's the system programmer was a fully integrated programming unit. It had an in-built digital cassette deck for program storage. Affectionately known as a "yellow telly" or "bumble bee" because of the distinctive yellow and black GEC livery. Later models introduced a floppy drive as well as the cassette for program storage.





## GEM 80 System Programmer Emulator.

With the advent of cheaper desktop PC's in the latter part of the 1980's a third-party company, *Advanced Technical Software* developed a PC based DOS program that emulated the operation of the System Programmer. This software became known as the Emulator. The operation was essentially the same as the system programmer except that the programs could be stored on the PC's hard disk or a floppy disk.

## GEC Projects Programmer (GPP).

GEC Projects based at Rugby, developed their own version of a system programmer emulator and called it GPP. This again emulated the operation of the original System Programmer. GEM CAD from GEC Project as used in Pilot still utilises the basic GPP menus at the ladder level. This was primarily sold as part of a project and therefore was not available as a product.

## Universal GEM 80 Programmer.

Advanced Technical Software updated their Emulator with more features and easier menu navigation and launched it as the universal GEM 80 programmer (UGP). Still essentially a DOS based programming device that refined some of the menus and operations of the original emulator.

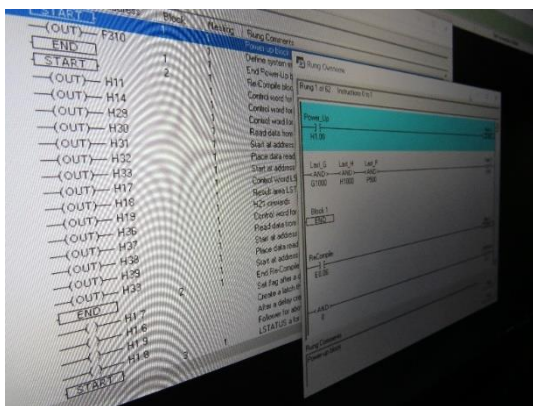
## P80 Pilot with GEM CAD.

Cegelec Projects at Rugby developed the GGP product further adding enhancements to GPP called GEM CAD, this GEM 80 programming software is then encapsulated in a Windows front end. The P80 Pilot front end enables the programmer to only go online if the offline and online programs are identical.

## Gemesys 3.

Developed by Cegelec/GEC Industrial Controls at Kidsgrove the Gemesys 3 programmer was the first full Windows programmer for GEM 80. It didn't have a particular large take up as most companies were still happy to use the older but faster DOS based programmers. This was due in some part to the operating speed of PC's at the time and their ability to run Windows at a reasonable speed.

## Advanced GEM 80 Programmer (AGP).



The latest programming package that runs on a Windows PC from Windows 2000 to Windows 10. AGP was developed by Advanced Technical Software in partnership with Alstom, it takes the GEM 80 programming package to a new level. It has a number of extra features that allow for quicker searching, monitoring and diagnostics. Some of these facilities are specific to the later 400 and 500 controllers, but the overall package will work with any GEM 80 controller. The latest AGP version 4 is now the widely accepted favourite GEM 80 programming package that can run on a Windows 10 PC. It can be used to import programs

from any of the previous programming packages such as UGP, GPP, Gemesys and with a suitable serial lead connecting the PC to the old dedicated programmers even system programmer files on cassette tape from 1979, true backwards compatibility.

For GEM 80 PLC training, support, spares and repairs contact, Automation Academy Ltd, <https://www.automation-academy.uk/> or email [info@autoac.uk](mailto:info@autoac.uk), we will be happy to help you.



GEM80  
Price List 2010





## **GEM80**

### **Price List**

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## **Introduction**

### **GEM80 Range of PLC's**

The **GEM80** is a range of Programmable Logic Controllers with common I/O, programming and communication facilities. The systems have been rationalized to two controllers providing the capability of controlling from standard to the most complex control applications. Compatibility with previous GEM80 systems **allows straightforward upgrade paths for existing users**.

We have been designing and manufacturing PLC's for nearly 30 years. Customers choose Converteam due to our high performance products combined with the security of first class support and service.

### **The PLC Range**

**GEM80-400:** GEM80-400 is a powerful and flexible PLC targeted at middle to high-end applications. The product is available in four architectural layouts: standard, enhanced, special and CE versions.

**GEM80-500:** The GEM80-500 is a flexible and powerful PLC suitable for both new applications and also for the upgrade of existing GEM80 applications. It is designed as a self contained unit with an integral power supply. It can be configured for either panel mounting or subrack mounting to meet your specific requirements.

## GEMTEQ I/O

A low cost distributed I/O system for the popular GEM80 500 Controller. Designed as the interface between the plant and the GEM80 PLC, the complete module family provides a flexible, simple and intelligent device.

Advanced diagnostics and embedded LED I/O indicators speed up troubleshooting and increases productivity.



### **GEM80-500 gets even more powerful.**

Memory increased from 20K to 40K user instructions as standard.

The GEM80-500 controller can now take advantage of the low cost GEMTEQ I/O.

**Profibus** and **DeviceNet** Modules have also been added to the Controllers options.

### **MODBUS TCP/IP option for GEM80 500 and GEM80 400 Controllers.**

The Ethernet sub module 9716-4020 (GEM80 500) and GEMLAN-T Module for GEM80 400 / 310 and 160 series controllers now supports Modbus Master / Slave protocol as standard.

## **Warranty and Commercial Conditions**

For full Terms and Conditions see the "Commercial Conditions" section in this Price List.

This price list is valid for dispatches from **1st January 2010**, and will be reviewed every three months, updates will be downloadable from [www.gem80.com](http://www.gem80.com)

## **Converteam UK Ltd. Kidsgrove**

**CONVERTEAM UK Ltd** has been established to provide sales and support for a wide range of industrial control products.

The Kidsgrove Factory, based in North Staffordshire combines both a manufacturing facility, technical and commercial operation in one Business Unit.

### **Main Products and Services**

- AC Drives
- ALSPA MV3000 AEM Drives
- Liquid/Air Cooled Deltas
- GEM80 PLC Sales and Support
- GEM80 Upgrade Projects
- ALSPA PLC Sales, Support and Projects
- ALSPA P1200 & HMI Sales, Support and Projects
- REPAIRS for CURRENT and mature product
- PRODUCT UPGRADES
- SPARES for mature drives products, GEMDRIVE DC DRIVES, ALSPA GD2000E / GD3000E, GD4000 BDM's
- CUBICLISED DRIVES AND PLCs
- Sub Contract Manufacturing Facilities

### **Contact details**

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**Fax : +44 (0) 1782 78 1112**

**E-mail : [product.service-uk@converteam.com](mailto:product.service-uk@converteam.com)**



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## Regional Business Centres

The Regional Business Centres (RBC) provides all your service and support needs for the lifetime of your equipment. They provide a complete range of support activities including spares, repairs, training and a full range of service contracts to ensure you get the most from operating the equipment. Installation, commissioning, upgrades and refurbishment's can also be supplied.

### 24 Hour Cover

A team of engineers is available to you 24 hours a day, every day of the year. These engineers are on standby and are always available via our call-out system. They are trained on all the **Kidsgrove Service Centre** products and have full access to our Spares Department's inventory both in and out of working hours.

If you require a quotation for a Service Contract please complete a copy of the form at the end of this price list. If you require further information about our services please contact Regional Business Centre (Kidsgrove) on 01782 781111.

All these services are available from the network of RBC offices.

## UK Regional Business Centres Locations

### Kent

Unit 2, The Courtyard, Campus Way,  
Gillingham Business Park, Gillingham, Kent  
Tel: 01732 874515 Fax: 01732 874575

### Middlesbrough

4A Brighthouse Business Village, Riverside Park,  
Middlesbrough, Cleveland, TS2 1RT  
Tel: 01642 254280 Fax: 01642 254287

### Rugby

Boughton Road, Rugby, Warwickshire, CV21 1BU  
Tel: 01788 563217 Fax: 01788 563765

### Sheffield

Newton Business Centre, Thorncliffe Park, Chapeltown, Sheffield, S35 2PH  
Tel: 0114 240 1912 Fax: 0114 240 1981

### Stoke-on-Trent

West Avenue, Kidsgrove, Stoke-on-Trent,  
ST7 1TW  
Tel: 01782 781111 Fax: 01782 781112

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Swansea, SA7 9ES  
Tel: 01732 563217 Fax: 01732 794069

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## **GEM80 PLC**

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## Introduction to GEM80 Programmable Controllers

GEM80 is a range of Programmable Controllers with common I/O, programming and communication facilities. The system has been rationalised to two controllers providing the capability of controlling from standard to the most complex control applications. Compatibility with previous GEM80 systems allows straightforward upgrade paths for existing users.

### GEM80-400

A Powerful medium to large range of controllers, recently enhanced to provide additional functionality. These controller allow built in graphics and fully integrate with the older Fast I/O System used with some GEM80 Systems.



### GEM80-500

A GEM80 PLC providing a low cost upgrade path for older existing GEM80 Controllers. Its low cost and physical size also make it ideal for new installations. Small but flexible with a range of extended features and diagnostics.



## GEM80 Controller Upgrades

The latest GEM80 controllers above provide current technology for existing systems. Upgrades can retain existing I/O structures and serial communication networks, retaining operator familiarity and reduced spares holding. The engineered software can be re-utilised and therefore functionality is retained in a cost effective and low risk engineering solution. Upgraded systems provide improved performance and reliability, with additional maintenance features and system support ensured for the future.

## **GEM80 Programmable Controllers**

### **GEM80-400 Introduction**

The GEM80-400 is a powerful Programmable Controller capable of handling the most complex control problems. The GEM80-400 has an I/O addressing capability of over 16000 digital I/O points or 1040 analogue values (8320 if using the 8108 Multiplexer) plus Fast I/O analogue depending on subrack configuration. Program capacity is 20000 user instructions as standard (expandable to 40000) with a fast processing speed of less than one millisecond per thousand instructions. The product is fully compatible with GEM80 Basic and Verification I/O structures and Central Highway modules such as IMAGEM, STARNET and GEMLAN-T. The GEM80-400 is equipped as standard with one Basic I/O Highway (256 digital I/O) and 1 Verification I/O Highway. Additional Basic I/O is connected using the 8191 Verification I/O Expander (512 digital I/O per expander).

The RAM / EPROM expansion module is a daughter board and does not occupy additional subrack space. One RAM / EPROM module can be fitted to each GEM80-400.

The GEM80-400 Processor can be housed in any of the four 19" subrack formats giving greater flexibility. The subrack formats are Standard, Enhanced, Special and CE.

Standard system combines Power Supply and GEM80-400 Processor in a 19" subrack with space for eight Basic or Verification I/O modules.

Enhanced system contains the GEM80-400 Processor and Power Supply, with space for 5 Central Highway modules and space for four Basic or Verification I/O modules.

Special system contains the GEM80-400 Processor, Power Supply and Fast I/O Driver, with space for 5 Central Highway modules and space for four Fast I/O modules.

**CE (Central Enhanced) system contains the GEM80-400 Processor, Power Supply, with space for 10 Central Highway modules.**

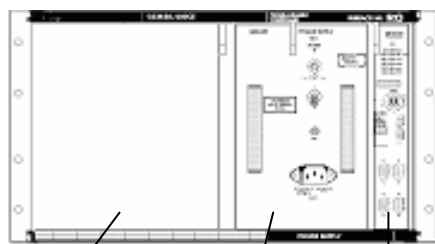
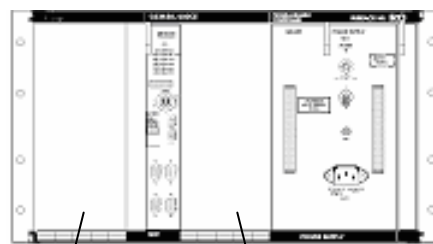
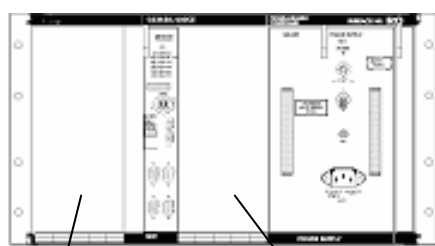
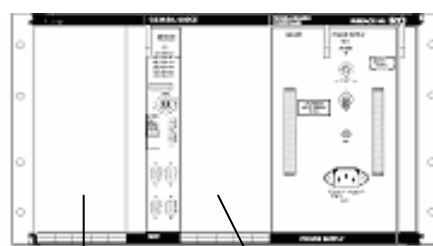
Each GEM80-400 comes equipped with two ESP serial links capable of running at 19.2kB and a separate programming port that can double as a printer port. The ESP links are RS485/232.

There are four versions of GEM80-400 Processor available equipped with or without a WorldFIP Fieldbus interface and with or without a Maths Co-processor.

The WorldFIP Fieldbus interface facility provides peer to peer communications at 1Mb between 32 GEM80-400s by means of a global database of up to 7680 words. The high efficiency of WorldFIP update time for the full configuration is less than 150mS. Each GEM80-400 can choose how much of the global database it reads and writes, giving flexibility to tailor the database to the needs of the application.

The Maths Co-processor provides a Floating Point Maths facility, accessing a range of additional 'Special Functions' for complex maths calculations, advanced Three Term Control. The version without Maths Co-processor allows cost effective upgrades on existing installations. GEMLAN-T provides a TCP/IP over Ethernet interface, for communication between GEM80 controllers or data exchange with SCADA and DCS systems.



**GEM80-400 Standard**8 Slots for  
Verification/ Basic I/OPower  
SupplyGEM80 400  
Processor**GEM80-400 Enhanced**4 Slots for  
Verification/ Basic I/O5 Slots for Central  
Highway Modules**GEM80-400 Special**4 Slots for  
Fast I/O Modules5 Slots for Central  
Highway Modules**GEM80-400CE**5 Slots for Central  
Highway Modules5 Slots for Central  
Highway Modules

Minimum GEM80-400 System comprises a processor, subrack and power supply:

|               |                                   |
|---------------|-----------------------------------|
| 400 Standard: | 8239-40** + 8857-4020 + 9032-4010 |
| 400 Enhanced: | 8239-40** + 8855-4010 + 9017-4010 |
| 400 Special:  | 8239-40** + 8855-4011 + 9017-4010 |
| 400 CE:       | 8239-40** + 8855-4012 + 9017-4010 |

**GEM80-400 Processor Modules**

|           |                                                                              |               |
|-----------|------------------------------------------------------------------------------|---------------|
| 8239-4006 | GEM80-400 Processor with maths Co-processor                                  | <b>£4,798</b> |
| 8239-4008 | GEM80-400 Processor with WorldFIP Fieldbus interface with Maths Co-processor | <b>£5,580</b> |
| 8239-4016 | GEM80-400 Processor                                                          | <b>£3,106</b> |
| 8239-4018 | GEM80-400 Processor with WorldFIP Fieldbus Interface                         | <b>£4,025</b> |

**GEM80-400 Subrack Options**

|           |                                                         |               |
|-----------|---------------------------------------------------------|---------------|
| 8855-4110 | GEM80-400 Enhanced Subrack (Metal)                      | <b>£1,408</b> |
| 8855-4111 | GEM80-400 Special Subrack (Metal)                       | <b>£1,490</b> |
| 8855-4112 | GEM80-400CE Subrack                                     | <b>£1,550</b> |
| 8857-4120 | GEM80-400 Standard/GEM80-500/Remote I/O Subrack (Metal) | <b>£1,395</b> |
| 8890-4910 | Optional Rear mounting kit for metal subracks only      | <b>£40</b>    |

**GEM80-400 Subrack Power Supplies**

|           |                                                                            |               |
|-----------|----------------------------------------------------------------------------|---------------|
| 9017-4010 | 110/220Vac/dc Power Supply for GEM80-400 Enhanced, Special and CE Subracks | <b>£2,885</b> |
| 9032-4010 | 110/220Vac/dc Power Supply for GEM80-400 Standard Subrack only             | <b>£1,320</b> |

**GEM80-400 Optional Enhancement**

|           |                                                                       |               |
|-----------|-----------------------------------------------------------------------|---------------|
| 9291-4004 | RAM Expansion Module for 40,000 instructions                          | <b>£449</b>   |
| 9291-4024 | EEPROM Expansion Module for 40,000 instructions                       | <b>£701</b>   |
| 8300-4003 | Fast I/O Driver (Required if connecting to existing Fast I/O)         | <b>£1,348</b> |
| 8890-4705 | Wiring Tray (Fits on the front of the subrack)                        | <b>£56</b>    |
| 8122-4003 | Central Highway Blanking Panel (Single Width)                         | <b>£58</b>    |
| 8975-0000 | RS232 to 20mA Converter (requires a separate $\pm 15\text{v}$ supply) | <b>£556</b>   |

**GEM80-400 Central Highway Modules**

Central Highway Modules can be fitted into the Central Highway slots on an Enhanced, Special or CE Subrack to provide additional features. The number of modules that can be fitted depends on the subrack selected. All Central Highway modules occupy a single slot, except the GEMLAN-T which is a double width module.

**RAM Expansion Module**

256k RAM expansion modules provide extra storage for off-line data and IMAGEM formats. If additional program capacity is needed, see the GEM80-400 Optional Enhancement.

|           |                                               |               |
|-----------|-----------------------------------------------|---------------|
| 8272-4004 | 256k Expansion RAM for IMAGEM / Off-line data | <b>£1,459</b> |
|-----------|-----------------------------------------------|---------------|

**SVGA IMAGEM**

The new IMAGEM module performs the same functions as the 8284-4002 but with SVGA outputs enabling it to be used with conventional, low cost PC monitors. The new module brings out separate H and V sync signals on BNC connectors as required by modern monitors, this is In addition to the existing three RGB signals. To facilitate ease of connection a specially designed BNC to 15 Way D Type converter board is available separately.

(See Data sheet T1949 for more details).

We also offer a version suitable for connection to the new range of TFT and LCD monitors.

The traditional IMAGEM module (Sync on Green) continues to be available for use with older monitors.

|           |                                                    |               |
|-----------|----------------------------------------------------|---------------|
| 8284-4004 | IMAGEM Graphics Coprocessor – SVGA for TFT and LCD | <b>£1,850</b> |
| 8284-4003 | IMAGEM Graphics Coprocessor – SVGA for CRT         | <b>£1,850</b> |
| 8284-4002 | IMAGEM Graphics Display Coprocessor (Traditional)  | <b>£2,750</b> |
| 9712-4010 | 5 BNC to 15 Way D-type adapter                     | <b>£212</b>   |

## STARNET

STARNET is an HDLC communications module that provides 4 high-speed point-to-point or multidrop links between GEM80-400s and to Variable Speed Drives. It provides a flexible command-and-control interface and runs at 180kB on each link. In ESP mode the STARNET module is compatible with the standard ESP links on all GEM80 and ALSPA 8000 PLCs and on ALSPA GD and Micro Variable Speed Drives.

Each link needs a termination panel. Connection between STARNET and ALSPA Micro Drives at 180kB uses the RS485 termination panel (8587). In ESP mode use any of those listed as appropriate. Each ribbon cable connects 2 termination panels to the STARNET module.

|           |                                     |               |
|-----------|-------------------------------------|---------------|
| 8268-4101 | STARNET Communication Module        | <b>£2,236</b> |
| 8587-4003 | RS485 Termination Panel             | <b>£615</b>   |
| 8891-4077 | 2 Way Serial Link Ribbon Cable      | <b>£51</b>    |
| 8924-0000 | 20mA Termination Panel              | <b>£550</b>   |
| 9009-4002 | RS232 Termination Panel for STARNET | <b>£525</b>   |

## Ethernet Communications

GEMLAN-T provides a TCP/IP over Ethernet interface for any suitable GEM80 Controller. GEM80 controllers, using GEMLAN-T, can exchange information with SCADA & DCS systems and any other systems that support TCP/IP or MODBUS. GEMLAN-T can also be used to provide a powerful and flexible peer-to-peer network between GEM80s.

The GLT-Ethernet card is able to execute the management and the treatment (polling, frame management, etc) of the embedded protocols, resulting in remarkable application performance.

|              |                                       |               |
|--------------|---------------------------------------|---------------|
| 8280-4001-Z  | GEMLAN-T TCP/IP Communications Module | <b>£2,700</b> |
| GLT-Ethernet | GEMLAN-T OPC Server and Ethernet Card | <b>£2,995</b> |

Further developments have been made to the GEMLAN-T module, which includes an in-built Web Server. Standard web pages can be used to monitor the status of the GEM80 and its application. Web pages can also be developed by the user and downloaded to the GEMLAN-T memory, allowing further displays to access application data using standard functions to read and write data. In addition to ESP TCP/IP protocol, MODBUS TCP/IP is also supported.

### Features of GLT – Ethernet Include:

- Intelligent card with dedicated processor and multi-tasking kernel managing all communication independently of the host PC.
- Generic application interface (OPC, DDE) independent of the protocol.
- Embedded TCP/IP provides a 6 fold increase in performance compared to a standard Ethernet card.
- Able to simultaneously manage multiple Ethernet messaging on same card without performance degradation.
- Comprehensive software suite including simple-to-use configuration and diagnostic tools.
- Supplied with drivers for GEMLAN-T.

**GEM80-400 Documentation and Spares**

|                     |                                                                                                               |            |
|---------------------|---------------------------------------------------------------------------------------------------------------|------------|
| T1614               | GEM80-400 Technical Manual                                                                                    | <b>£27</b> |
| T1653               | GEM80 FIP Interface Manual                                                                                    | <b>£26</b> |
| T2011               | GEMLAN-T Technical Manual                                                                                     | <b>£10</b> |
| T390                | IMAGEM Technical Manual                                                                                       | <b>£29</b> |
| T464                | STARNET User Information                                                                                      | <b>£26</b> |
| S78802/350<br>Note1 | Battery kit for old GEM80 400 Processors with Orange Battery Holder. Kit contains 1 new holder, 1 new battery | <b>£46</b> |
| S78802/352          | Battery for current GEM80 400 Processors with Grey Battery Holder(Pack of 2 Batteries)                        | <b>£35</b> |
| S20T0319/01         | Battery for GEM80 RAM Card types 8272, 8222 or 8220                                                           | <b>£61</b> |

**Note 1**

This kit requires the user to solder the new battery holder onto the GEM80 400 Processor. If further assistance is required please contact Technical Support on + 44 (0)1782 781111.

## GEM80-500 Introduction

### Specification Summary

- Up to 40K User Instructions
- Traditional GEM80 ladder language
- Flash Memory Support
- 4 character display
- Real time clock
- 100 event system log
- User firmware upgrades
- PC104 architecture
- Standard GEM80 Programming Port



The GEM80-500 is a flexible and powerful PLC designed to complement the existing range of GEM80 products. The GEM80-500 has similar performance to the GEM80-400 but is physically smaller and self-contained having a power supply and processor in a single metal enclosure. For this reason it does not support any Central Highway modules.

The controller requires the use of plug-in sub-modules in order to configure the system to the user's requirement. These sub-modules allow the GEM80-500 to support Ethernet, Basic and Verification I/O, GEMTEQ and WorldFIP. Further sub-modules are planned for the future.

The GEM80-500 is ideally suited for upgrade applications where it can be used to replace a variety of previous generation GEM80 controllers whilst retaining the user's original control program and I/O structure. The GEM80-500 is supplied with optional bracket for backplate mounting or it can be housed in an existing GEM80 subrack.

Sub-modules are supplied separately for user configuration or can be factory assembled into the controller as required. If the controller is supplied factory configured with the users sub-modules specified, the GEM80-500 will be tested as a complete unit.

### GEM80-500 Controllers without Maths

|                 |                                                          |               |
|-----------------|----------------------------------------------------------|---------------|
| 8870-4979-Z     | GEM80-500 Controller, 40K user instruction, 88-264V ac   | <b>£1,313</b> |
| 8870-4979DC24-Z | GEM80-500 Controller, 40K user instruction, 24Vdc supply | <b>£1,465</b> |
| 8870-4979DC48-Z | GEM80-500 Controller, 40K user instruction, 48Vdc supply | <b>£1,465</b> |

GEM80-500 controllers can be ordered with sub-modules pre-installed.

See 'GEM80-500 Factory Configured Sub-Modules' for details.

### GEM80-500 Sub-Modules

The GEM80-500 has the ability to house **one Ethernet sub-module** and up to **five further sub-modules**, which can consist of:

- Up to 2 Serial Port sub-modules (4 ports in total).
- Up to 2 Basic I/O sub-modules (2 x 512 bits)
- One Verification/ Basic sub-module (expanded with one Basic I/O module)
- One WorldFIP sub-module.
- Up to 2 GEMTEQ Scanner Modules.
- Up to 2 Profibus Master Interface Modules\*
- Up to 2 DeviceNet Interface Modules\*

\*The maximum limit for Profibus or DeviceNet is two modules.

For full details of Sub Module configuration rules refer to T2025en GEM80-500 Technical Manual or telephone Technical Support on +44 (0)1782 781111.

|             |                                                                       |               |
|-------------|-----------------------------------------------------------------------|---------------|
| 9713-4021   | Basic I/O sub-module (512 bits)                                       | <b>£245</b>   |
| 9713-4020   | Basic (256 bits) & Verification (1024) words) I/O sub-module          | <b>£245</b>   |
| 9714-4020   | 2 serial port sub-module, ESP, RS232 or RS485                         | <b>£398</b>   |
| 9715-4020   | WorldFIP Communications sub-module                                    | <b>£625</b>   |
| 9716-4020-Z | Ethernet sub-module                                                   | <b>£990</b>   |
| 9720-4020   | GEMTEQ Scanner Module (for use with GEMTEQ I/O)                       | <b>£350</b>   |
| 9723-4020   | Profibus Master Interface (Requires Ethernet module to be installed)  | <b>£1,396</b> |
| 9724-4020   | DeviceNet Master Interface (Requires Ethernet module to be installed) | <b>£1099</b>  |
| 9727-4020   | Ethernet Adapter (required if no "Z" suffix on existing controller)   | <b>£215</b>   |

### GEM80-500 Factory Configured Sub-Modules

Sub-modules are supplied individually boxed, but can be factory assembled into the controller. If this option is selected any sub-modules ordered at the same time will then be mounted into the GEM80-500 and unit tested.

To select the configured option the Controller ordering code should include 'C' to denote Configured as follows:

Example:       **8870-4979** GEM80-500 Controller – unconfigured  
                  **8870C4979** GEM80-500 Controller –configured

For the configured service add £80 to the quoted list price of each controller.

## GEM80-500 Optional Extras

- GEM80-500 Backplate mounting kit**

The GEM80-500 is designed to be similar in size to the GEM80 Power Supply Units. When upgrading controllers this usually allows the GEM80-500 to be sited in the superseded controller subrack. The Mounting Kit allows the GEM80-500 to be mounted directly to any backplate.

- GEM80-500 Host Subrack Interface Module**

The GEM80-500 is ideally suited for upgrades to GEM80-100/130, GEM80-200, GEM80-140 and GEM80-160 Series controllers. In the case of GEM80-140 and 160 series controllers, subracks may contain local Basic I/O modules. To retain these modules in the controller subrack a Host Subrack Interface Module can be used. This module fits into the controller subrack and provides a connection path between the GEM80-500 and the existing I/O.

- GEM80-500 Auxiliary Power Termination Panel**

In some cases the power requirement of the Basic I/O connected to the GEM80-500 via Basic I/O Ribbon Cables may exceed that available. The user would then need to add an external 15V supply. If the existing I/O subracks exclude the facility to interface an additional supply an Auxiliary Power Termination Panel will be needed. This allows the user to isolate the GEM80 supply in the ribbon cable and introduce the external supply to power the subracks.

|           |                                                                           |              |
|-----------|---------------------------------------------------------------------------|--------------|
| 8890-4900 | GEM80-500 Backplate mounting kit (cubicle)                                | <b>£25</b>   |
| 9717-4020 | GEM80-500 Host Subrack Interface Module                                   | <b>£450</b>  |
| 9721-4001 | GEM80-500 Auxiliary Power Termination Panel                               | <b>£80</b>   |
| 8191-4004 | Verification I/O Expander (Converts Verification I/O into 512 bits Basic) | <b>£1065</b> |
| 8975-0000 | RS232 to 20mA Converter (requires a separate $\pm 15\text{v}$ supply)     | <b>£556</b>  |

## GEM80-500 Documentation and Spares

|             |                                                       |            |
|-------------|-------------------------------------------------------|------------|
| T2011En     | GEMLAN-T Technical Manual                             | <b>£10</b> |
| T2025En     | GEM80-500 Technical Manual                            | <b>£20</b> |
| T1653       | GEM80 FIP Interface Manual                            | <b>£26</b> |
| S41Y8230/10 | Spare +15v power connector assembly (For Sub-Modules) | <b>£20</b> |

**GEM80 I/O Introduction**

GEM80 I/O is available in a variety of configurations to suit the application.

**Basic and Verification I/O** are both local I/O structures, the modules being house in I/O subracks which are located in the vicinity of the controller itself.

**Remote I/O** uses the same I/O modules but allows the subracks to be dispersed around the plant, significantly reducing plant cabling and installation costs. It also allows two controllers to be connected to the same I/O, offering a hot standby configuration giving greater operational security if required

**GEMTEQ** a generation of distributed I/O specifically for the GEM80-500.

Up to 125 Modules can be fitted per GEM80-500 GEMTEQ Scanner Sub-module and can be placed at distributed points, local or remote to the GEM80-500. Quick connect wiring and network lengths up to 5000 metres, along with PLC Redundancy and High Availability network configurations make this a powerful solution.

**Basic I/O Digital Input Modules**

Some GEM80 I/O modules have D-type connectors for plant connections. In each case an optional cable harness is available to simplify the cubicle wiring from these modules to cubicle terminal rails.

|           |                                                  |             |
|-----------|--------------------------------------------------|-------------|
| 8110-4002 | 9-66Vdc-8 Way Input Module                       | <b>£548</b> |
| 8111-4002 | 110Vac, 8 Way Input Module                       | <b>£569</b> |
| 8112-4002 | 220Vac, 8 Way Input Module                       | <b>£558</b> |
| 8120-4002 | 9-66Vdc Inverse, 8 Way Input Module              | <b>£660</b> |
| 8163-4002 | 24Vdc, 32 Way Input Module                       | <b>£385</b> |
| 8177-4001 | 110Vac, 16 Way Input Module                      | <b>£626</b> |
| 8197-4002 | 48Vdc, 32 Way Input Module                       | <b>£395</b> |
| 9513-4002 | 24Vdc, 16 Way Input Module                       | <b>£608</b> |
| 8891-4395 | Cable Harness for 32 Way Input Modules           | <b>£122</b> |
| 8890-4142 | I/O Module Plant Connector for 8 way I/O Modules | <b>£35</b>  |

**Basic I/O Digital Output Modules**

|           |                                                  |             |
|-----------|--------------------------------------------------|-------------|
| 8113-4002 | 9-66Vdc, 1.5A, 8 Way Output Module               | <b>£562</b> |
| 8114-4002 | 110Vac, 1.5A, 8 Way Output Module                | <b>£835</b> |
| 8115-4002 | 220Vac, 1.5A, 8 Way Output Module                | <b>£742</b> |
| 8121-4002 | 9-66Vdc Inverse, 1.5A, 8 Way Output Module       | <b>£878</b> |
| 8164-4002 | 24Vdc, 0.5A, 32 Way Output Module                | <b>£626</b> |
| 8178-4001 | 110Vac, 0.5A, 16 Way Output Module               | <b>£712</b> |
| 8198-4002 | 48Vdc, 0.5A, 32 Way Output Module                | <b>£636</b> |
| 8891-4399 | Cable Harness for 32 Way Output Modules          | <b>£122</b> |
| 9514-4002 | 24Vdc, 0.5A, 16 Way Output Module                | <b>£695</b> |
| 9543-4002 | Relay with Enable, 8 Way Output Module           | <b>£498</b> |
| 8890-4142 | I/O Module Plant Connector for 8 way I/O Modules | <b>£35</b>  |



**Basic I/O Analogue Input Modules**

|           |                                                                                 |               |
|-----------|---------------------------------------------------------------------------------|---------------|
| 8108-4003 | ±5V, ±10V, 0-20mA, 16 Channel Multiplexer                                       | <b>£1,595</b> |
| 8150-4002 | ±10V, 0-20mA, 2 Channel Input Module                                            | <b>£985</b>   |
| 8891-4010 | Voltage Input Termination Rail for Multiplexer                                  | <b>£289</b>   |
| 8891-4014 | Current Input Termination Rail for Multiplexer                                  | <b>£314</b>   |
| 8891-4028 | Termination rail for 2 Channel Input Module                                     | <b>£165</b>   |
| 8891-4068 | Cable Harness for 16 Channel Multiplexer                                        | <b>£450</b>   |
| 8891-4094 | Cable Harness for Remote I/O Controller, Outstation or Analogue and Counter I/O | <b>£56</b>    |

**Basic I/O Analogue Output Modules**

|           |                                                                                 |               |
|-----------|---------------------------------------------------------------------------------|---------------|
| 8151-4002 | ±10V, 0.20mA, 2 channel Output Module                                           | <b>£1,122</b> |
| 8891-4026 | Termination Rail for 2 Channel Output Module                                    | <b>£160</b>   |
| 8891-4094 | Cable Harness for Remote I/O Controller, Outstation or Analogue and Counter I/O | <b>£56</b>    |

**Basic I/O Counter Module**

|           |                                                                                 |             |
|-----------|---------------------------------------------------------------------------------|-------------|
| 8160-4008 | 2 x 8 bit or 1 x 16 bit, 20kHz Bi-phase 2 Way Counter Input                     | <b>£505</b> |
| 8891-4029 | Termination Rail for Counter Input Module                                       | <b>£288</b> |
| 8891-4094 | Cable Harness for Remote I/O Controller, Outstation or Analogue and Counter I/O | <b>£56</b>  |

**Verification I/O Modules**

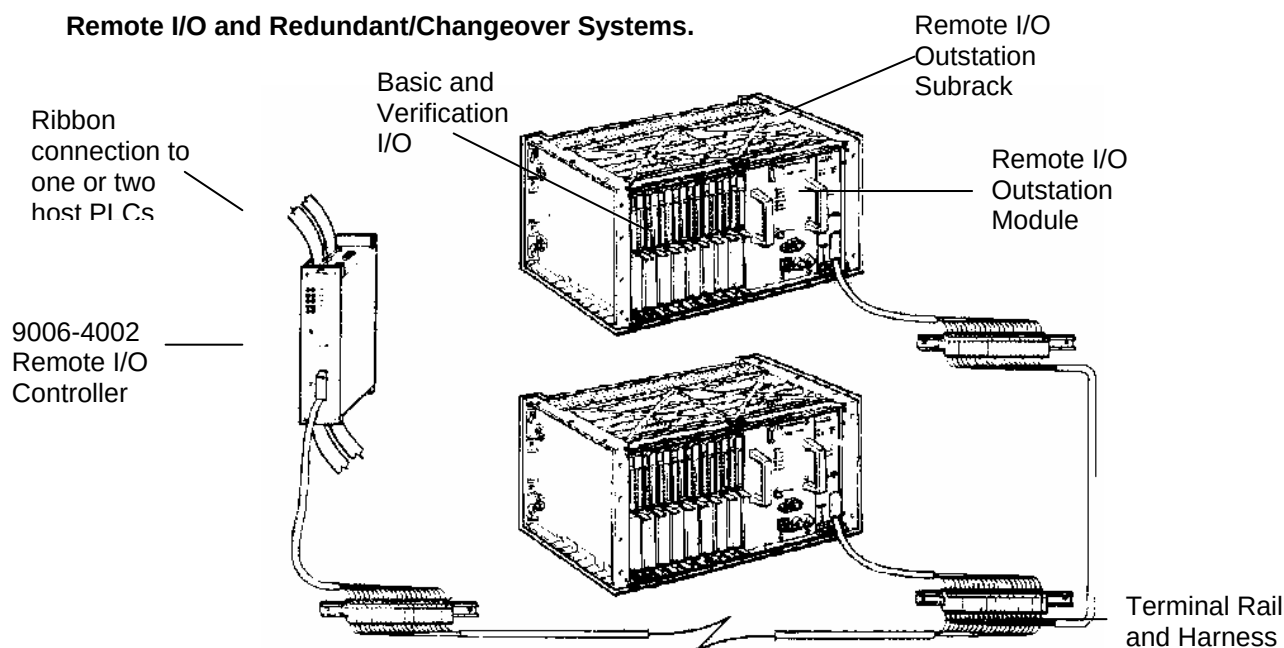
|           |                                                    |               |
|-----------|----------------------------------------------------|---------------|
| 8165-4004 | 16 single or 8 Differential Analogue Input Module  | <b>£1,529</b> |
| 8166-4002 | 16 single or 8 Differential Analogue Output Module | <b>£1,964</b> |
| 8199-4001 | Unlatched Relay, 16 Way Output                     | <b>£709</b>   |
| 8891-4102 | Cable Harness for 8165/8166                        | <b>£264</b>   |

Note: The 8165 and 8166 have ±20V, ±10V, ±5V, 0-5V, 0-10V, ±20mA, ±10mA, 0-20mA, 0-10mA ranges available:

**Basic and Verification I/O Subracks and accessories**

|           |                                                                           |              |
|-----------|---------------------------------------------------------------------------|--------------|
| 8859-4103 | 12 Slot I/O Subrack for Basic and Verification I/O                        | <b>£1105</b> |
| 8890-4611 | I/O Ribbon Cable (4 connectors)                                           | <b>£55</b>   |
| 8890-4705 | Wiring Tray (Fits on the front of the subrack spacer)                     | <b>£56</b>   |
| 8122-4001 | I/O Blanking Panel (Single Width)                                         | <b>£38</b>   |
| 8191-4004 | Verification I/O Expander (Converts Verification I/O into 512 bits Basic) | <b>£1065</b> |

**Remote I/O and Redundant/Changeover Systems.**



**Remote I/O**

Basic and Verification I/O can be configured as a local I/O structure where the I/O racks are located in the vicinity of the controller itself.

A Remote I/O structure is also available, which uses the same I/O modules but allows the subracks to be located on the factory floor, significantly reducing plant cabling installation costs.

Using a Remote I/O Changeover Unit, two GEM80-400 or GEM80-500 controllers can be coupled to the same I/O structure, in a hot standby configuration, giving greater operational security

**Redundant/Changeover Systems**

The Remote I/O System also includes the changeover functionality required for Redundant Controller Systems. The Remote I/O Controller connects two GEM80-400 or GEM80-500 controllers so that both receive the input data from the I/O fitted in the Remote I/O Outstations. The status of each PLC is hardwired to the Remote I/O Controller, which feeds the output from the on-line PLC to the Remote I/O. Should the on-line PLC fail or be deliberately halted from program changes, control of the outputs passes to the other PLC.

**Remote I/O**

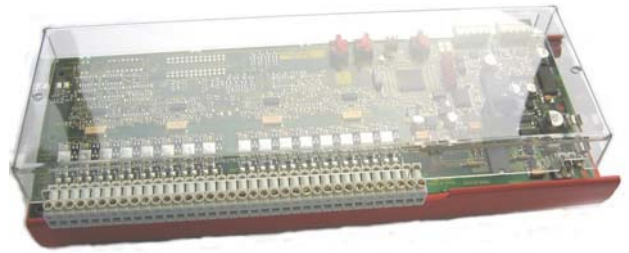
|           |                                                                                 |               |
|-----------|---------------------------------------------------------------------------------|---------------|
| 8174-4004 | Remote I/O Outstation Module                                                    | <b>£1,311</b> |
| 8857-4120 | GEM80-400 Standard/GEM80-500/Remote I/O Subrack                                 | <b>£1,395</b> |
| 8890-4611 | I/O Ribbon Cable (4 connectors)                                                 | <b>£55</b>    |
| 8891-4032 | Terminal Rail for Remote I/O Controller or Outstation                           | <b>£251</b>   |
| 8891-4094 | Cable Harness for Remote I/O Controller, Outstation or Analogue and Counter I/O | <b>£56</b>    |
| 9006-4002 | Remote I/O Controller                                                           | <b>£2,294</b> |
| 9032-4010 | Power Supply for GEM80-400 Standard and Remote I/O Outstation Subrack           | <b>£1,320</b> |
| 8191-4004 | Verification I/O Expander (Converts Verification I/O into 512 bits Basic)       | <b>£1065</b>  |

## GEMTEQ I/O

GEMTEQ is the 4th generation of I/O modules specifically for the GEM80-500 programmable logic controller.

Designed as the interface between the plant and the GEM80 PLC the complete module family provides a flexible, simple and intelligent device.

Advanced diagnostics and embedded LED I/O indicators speed up troubleshooting and increases productivity



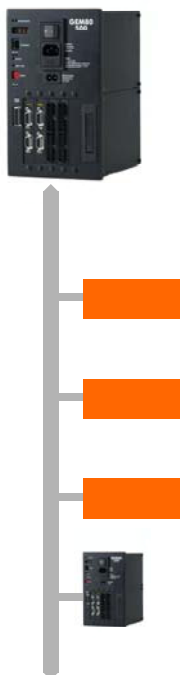
Removable wiring connector saves time and speeds up commissioning, the hot-swap ability minimizes downtime.

## System Design

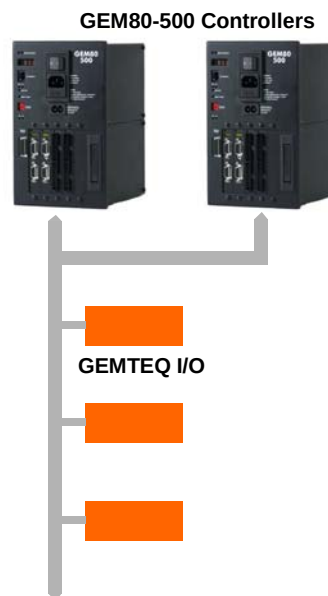
Each GEMTEQ I/O system can consist of: -

- GEMTEQ I/O Scanner module in a host GEM80-500 PLC (Produces the GEMCAN Network)
- GEMTEQ I/O modules
- GEM80-500 PLCs as slave devices (optional)
- Up to 125 nodes per GEMTEQ I/O Scanner module scanner
- 2 scanners per host PLC

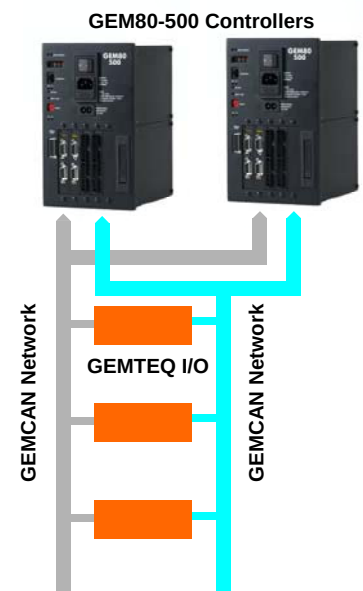
### GEMCAN Network



### GEMCAN PLC Redundancy



### GEMCAN High Availability



**GEMTEQ Input Modules**

|           |                               |             |
|-----------|-------------------------------|-------------|
| 9730-4012 | GEMTEQ 16 Channel I/P 24V dc  | <b>£354</b> |
| 9732-4012 | GEMTEQ 16 Channel I/P 110V ac | <b>£378</b> |

**GEMTEQ Output Modules**

|           |                                       |             |
|-----------|---------------------------------------|-------------|
| 9731-4012 | GEMTEQ 16 Channel O/P 24V dc @ 500mA  | <b>£354</b> |
| 9733-4012 | GEMTEQ 16 Channel O/P 110V ac @ 1A    | <b>£496</b> |
| 9735-4012 | GEMTEQ 16 Channel Relay O/P 3A 250Vac | <b>£528</b> |

**GEMTEQ Combined Analogue Input / Output Modules**

|           |                                            |             |
|-----------|--------------------------------------------|-------------|
| 9734-4012 | GEMTEQ Analogue 8 I/P + 8 O/P 0-20mA +10v  | <b>£515</b> |
| 9737-4012 | GEMTEQ Analogue 16 I/P + 8 O/P 0-20mA +10v | <b>£700</b> |

Input:  $\pm 10$ V bipolar (Nominal)-10.24 to 10.235V  
0 to 20mA, 4 to 20mA (Nominal) 0 to 20.47mA

Output:  $\pm 10$ V bipolar (Nominal)-10.24 to 10.235V  
-20 to 20mA (Nominal)-20.48 to 20.47mA (sink / sourced from  $\pm 10$ V)

**GEMTEQ Counter Module**

|           |                       |             |
|-----------|-----------------------|-------------|
| 9736-4012 | GEMTEQ Counter Module | <b>£540</b> |
|-----------|-----------------------|-------------|

The GEMTEQ Counter Module can operate as four 16-bit unidirectional counters, or two 16-bit bi-directional counters, or one 32-bit bi-directional counter. 24V or 5V (RS422) Operation, 80KHz count rate (Max).

8 Digital Inputs (Dedicated function)

4 Digital Outputs (Dedicated function)

**GEM80 Manuals**

The Technical Manuals for GEM80 PLCs are supplied separately, so that they can be delivered early or ordered as additional copies. Most GEM80 Technical Manuals and User information are supplied free of charge. However multiple additional copies can be ordered using the following order codes.

Documentation is available for free to download. Visit [www.gem80.com](http://www.gem80.com)

**Controllers**

|         |                            |            |
|---------|----------------------------|------------|
| T1614   | GEM80-400 Technical Manual | <b>£27</b> |
| T1653   | GEM80 FIP Interface Manual | <b>£26</b> |
| T2025En | GEM80-500 Technical Manual | <b>£20</b> |

**GEM80 400 Central Highway and GEM80 500 Option Modules**

|       |                                                     |            |
|-------|-----------------------------------------------------|------------|
| T390  | IMAGEM Manual                                       | <b>£29</b> |
| T464  | STARNET                                             | <b>£26</b> |
| T2011 | GEMLAN-T Technical Manual (Also GEM80 500 Ethernet) | <b>£20</b> |

**GEM80 I/O Specific**

|         |                                                    |            |
|---------|----------------------------------------------------|------------|
| T445    | Remote I/O and Redundant/Changeover Systems Manual | <b>£26</b> |
| T2031En | GEM80 GEMTEQ I/O User Manual                       | <b>£25</b> |
| T1504   | 12 Slot I/O Subrack User Information               | <b>£10</b> |
| T438    | Compact I/O Modules (Basic) User Information       | <b>£10</b> |

**GEM80 Spares**

|                            |                                                                                                               |             |
|----------------------------|---------------------------------------------------------------------------------------------------------------|-------------|
| 8890-4144                  | I/O Modules Plant Connector for 8177/8 & 9513/14 I/O modules                                                  | <b>£58</b>  |
| 8890-4142                  | I/O Module Plant Connector for most 8 way I/O Modules                                                         | <b>£35</b>  |
| 8890-4600                  | I/O Modules Plant Connector the 9543 & 8168 I/O Modules                                                       | <b>£58</b>  |
| 8890-4740                  | I/O Module Plant Connector for the 8199 I/O Modules                                                           | <b>£72</b>  |
| 9020-4001                  | RS232/20mA programming Lead                                                                                   | <b>£182</b> |
| S20T0319/01                | Battery for 256k RAM Card (8272)                                                                              | <b>£61</b>  |
| S78802/350<br><b>Note1</b> | Battery kit for old GEM80 400 Processors with Orange Battery Holder. Kit contains 1 new holder, 1 new battery | <b>£46</b>  |
| S78802/352                 | Battery for GEM80-131 & 400 Processors (Pack of 2)                                                            | <b>£35</b>  |

**Note 1**

This kit requires the user to solder the new battery holder onto the GEM80 400 Processor. This should only be attempted by competent personnel as this is a multi-layer PCB. If further assistance is required please contact Technical Support on + 44 (0)1782 781111

## GEM80 Programming – Advanced GEM80 Programmer (AGP)

The Advanced GEM80 Programmer is the latest generation in a range of programming tools for the GEM80 range of PLC's. It has been designed to replace the aging UGP, Gemesys and GPP packages that can no longer operate on the latest Windows operating systems.

The package itself provides extensive facilities for developing, documenting, testing and maintaining your GEM80 applications.

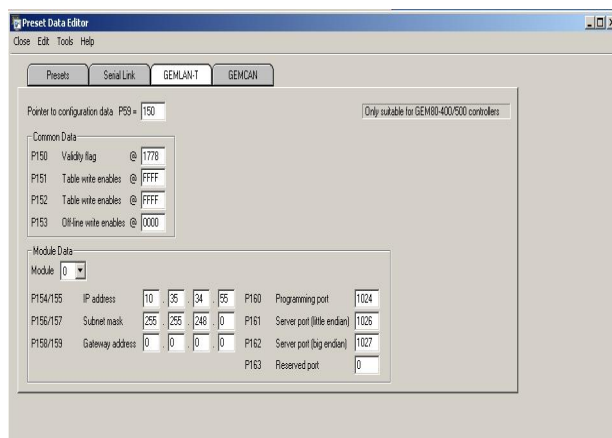
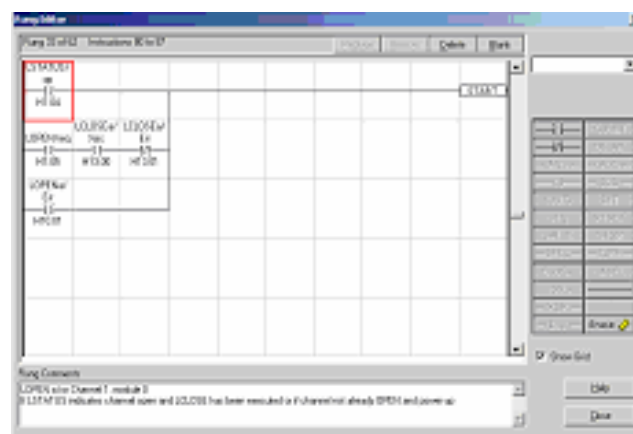
Compatible with all GEM80 Controllers including GEM80-100/200, GEM80 160/250, GEM80-300/310, GEM80-400/500 series, IMAGEM, Paged Video, Programmable Serial Communications and ALSPA Micro 2 Drives and much more.

The Advanced GEM80 Programmer is designed to run on Microsoft Windows 2000 and Windows XP.

### Key Features

#### *Easy to use Editors*

- **RUNG EDITOR** - For concise and quick editing of user program
- **LADDER SUMMARY** - Displays a list of all rungs with associated comments for easy navigation.
- **RUNG OVERVIEW** - Shows multiple rungs with live data if connected to GEM80.



- **PRESET DATA EDITOR** - Allows easy editing of GEM80 Preset tables. GEM80 500 / 400 controllers can also take advantage of easy to use prompted configuration of these tables.
- **DATA TABLE EDITOR** - Easy to use with nameable tabbed display windows to allow segregation of tables. Save these and recall at any time.
- **TABLES USED** - At a glance AGP with provide a summary of the highest tables used.

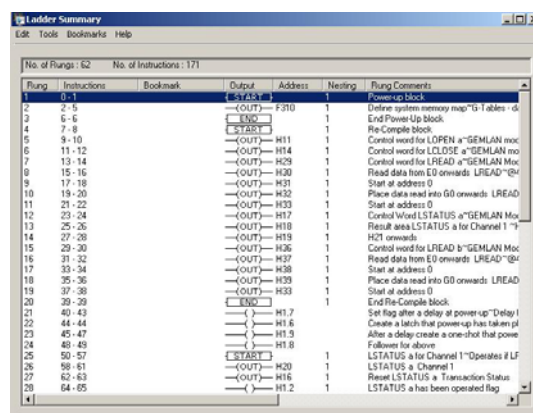
- **GEM80 TEXT EDITOR** - Allows on-line changes to the GEM80 message area.
- **IMAGEM and GEMDRIVE EDITOR** - Allows the package to support editing and storage to these system.
- **OFF-LINE MESSAGE EDITOR** - Allows changes to the GEM80 message area not normally accessible off-line with other programming tools.

**POWERFUL Tools**

- **IMPORT OLD PROGRAMS** – Old programs created on Universal GEM Programmer, GPP, Gemesys and Disk System Programs can be imported retaining that important documentation.
- **CHANGE ADDRESSES** – Want to change the tables used in your program? Just a few clicks can make changes that will take days to complete with other packages. Idea for system upgrades.
- **COMPARISON FACILITIES** – Compare your programs with other copies and get extensive reports of differences.
- **EXPORT / IMPORT RUNGS** -This allows you to select a range of rungs and save them to disk. These can then be imported 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.
- **EXPORT / IMPORT P-TABLES** – Similar function to that above
- **RECOMBINE DOCUMENTATION** - If you have a project in the AGP that has no or little documentation, possibly as a result of transferring the program directly from the GEM80, this allows you to recombine it with the documentation in an AGP project file saved on disk.
- **EASY CONFIGURATION** – Serial ports, GEMLAN-T and GEMCAN can be configured using assisted configuration options (GEM80 400 AND 500 only)
- **ETHERNET** - Serial and Ethernet communication supported to GEM80 controllers

**Extensive Monitoring and Fault diagnostics**

- **RUNG MONITOR** – Monitor multiple rungs, change displayed data format, write values if allowed.
- **TABLE MONITOR** – Tables shown in hex, decimal, binary with all available mnemonics. Change tables values if allowed and save your table monitor configuration for future use if required.

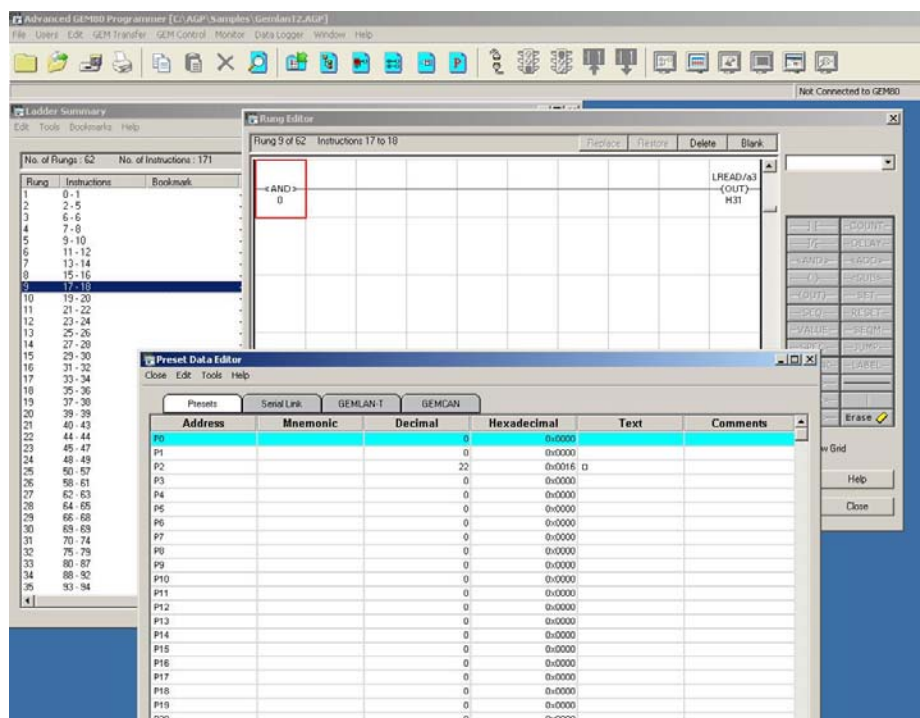


The screenshot shows a window titled 'Ladder Summary' with a menu bar (Edit, Tools, Bookmarks, Help) and a status bar (No. of Rungs: 62, No. of Instructions: 171). The main area is a table with columns: Rung, Instructions, Bookmark, Output, Address, Nesting, and Rung Comments. The table lists 62 rungs, each with a range of instructions and a description of the logic or action performed, such as 'Define system memory map', 'End Power Up block', and 'Control word for LREAD'.

| Rung | Instructions | Bookmark | Output | Address | Nesting | Rung Comments                             |
|------|--------------|----------|--------|---------|---------|-------------------------------------------|
| 1    | 0-1          |          | END    |         | 1       | Power Up block                            |
| 2    | 2-5          |          | OUT    | F20     | 1       | Define system memory map to tables d      |
| 3    | 6-6          |          | END    |         | 1       | End Power Up block                        |
| 4    | 7-8          |          | END    |         | 1       | File Complete block                       |
| 5    | 9-10         |          | OUT    | H11     | 1       | Control word for LOPEN a "GEMLAN mac      |
| 6    | 11-12        |          | OUT    | H14     | 1       | Control word for LCLOSE a "GEMLAN mo      |
| 7    | 13-14        |          | OUT    | H29     | 1       | Control word for LREAD a "GEMLAN Mac      |
| 8    | 15-16        |          | OUT    | H30     | 1       | Read data from EO onwards LREAD "G        |
| 9    | 17-18        |          | OUT    | H31     | 1       | Start at address 0                        |
| 10   | 19-20        |          | OUT    | H32     | 1       | Place data read into G0 onwards LREAD     |
| 11   | 21-22        |          | OUT    | H33     | 1       | Start at address 0                        |
| 12   | 23-24        |          | OUT    | H17     | 1       | Control word LSTATUS a "GEMLAN Mac        |
| 13   | 25-26        |          | OUT    | H18     | 1       | Reset area LSTATUS a for Channel 1        |
| 14   | 27-28        |          | OUT    | H19     | 1       | H21 onwards                               |
| 15   | 29-30        |          | OUT    | H36     | 1       | Control word for LREAD b "GEMLAN Mac      |
| 16   | 31-32        |          | OUT    | H37     | 1       | Read data from EO onwards LREAD "G        |
| 17   | 33-34        |          | OUT    | H38     | 1       | Start at address 0                        |
| 18   | 35-36        |          | OUT    | H39     | 1       | Place data read into G0 onwards LREAD     |
| 19   | 37-38        |          | OUT    | H33     | 1       | Start at address 0                        |
| 20   | 39-39        |          | END    |         | 1       | End File Complete block                   |
| 21   | 40-43        |          | OUT    | H17     | 1       | Set flag after a delay at power up Delay  |
| 22   | 44-44        |          | OUT    | H18     | 1       | Create a latch that power up has taken p  |
| 23   | 45-47        |          | OUT    | H15     | 1       | After a delay create a one-shot that powe |
| 24   | 48-49        |          | OUT    | H18     | 1       | Follows for above                         |
| 25   | 50-57        |          | OUT    | H18     | 1       | LSTATUS a for Channel 1 Operates if L     |
| 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    | H12     | 1       | LSTATUS a has been operated flag          |

- **EVENT LOG ACCESS** – Access to the event log available on GEM80 400 and 500 controllers
- **TEST PANEL** - This facility is a more versatile way of testing programs. Basically it comprises of five 3x16 grids of cells, each cell can be given a function and the entire layout saved to disk and re-loaded at a later time. Each cell can be configured as one of the following: Switch used to force a digital value, Lamp used to indicate whether a digital value is on/off, Numeric Entry to display or force an analogue value, Descriptive Text used to clarify the test panel layout, or Left blank.
- **DATA LOGGER** - This facility monitors and logs tables within the GEM80 at a given time interval or on condition. This data can be saved to disk and subsequently converted to a CSV file that can then be exported to other programs that support CSV.
- **DIAGNOSTIC MONITOR** - This is a sizeable, tabbed window displaying diagnostics information as supplied by the GEM80. For GEM80 400 and 500 Controllers the information can be displayed with associated function within the controller.





### Advanced GEM80 Programmer (AGP) Software

|                |                                                                           |               |
|----------------|---------------------------------------------------------------------------|---------------|
| GEM80-AGP-PF-P | Advanced GEM80 Programmer – Professional with parallel dongle – see note. | <b>£1,650</b> |
| GEM80-AGP-PF-U | Advanced GEM80 programmer - Professional with USB dongle - see note       | <b>£1,650</b> |
| 8890-4640      | GEM80 AGP RS232 Programming Cable – Spare                                 | <b>£56</b>    |
| 9020-4001      | RS232/20mA Programming Lead                                               | <b>£182</b>   |

### NOTE

The Advanced GEM80 Programmer is supplied with a RS232 Programming Cable (8890-4640) which is suitable for GEM80 400 and 500 controllers only.

For operation with older controllers and Imagem you require the RS232/20mA lead (9020-4001), as used with Gemesys.

### Advanced GEM80 Programmer Upgrades

|                   |                                                   |            |
|-------------------|---------------------------------------------------|------------|
| GEM80-AGP-VER-U/G | Advanced GEM80 Programmer Version ONLY Upgrade    | <b>POA</b> |
| GEM80-AGP-PF-U/G  | Advanced GEM80 Programmer Upgrade to Professional | <b>POA</b> |

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## Alphanumeric Listing

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## Alphanumeric Listing

| Item            | Description                                                                  | 2010 Price |
|-----------------|------------------------------------------------------------------------------|------------|
| 8108-4003       | ±5V, ±10V, 0-20mA, 16 Channel Multiplexer                                    | £1,595     |
| 8110-4002       | 9-66Vdc-8 Way Input Module                                                   | £548       |
| 8111-4002       | 110Vac, 8 Way Input Module                                                   | £569       |
| 8112-4002       | 220Vac, 8 Way Input Module                                                   | £558       |
| 8113-4002       | 9-66Vdc, 1.5A, 8 Way Output Module                                           | £562       |
| 8114-4002       | 110Vac, 1.5A, 8 Way Output Module                                            | £835       |
| 8115-4002       | 220Vac, 1.5A, 8 Way Output Module                                            | £742       |
| 8120-4002       | 9-66Vdc Inverse, 8 Way Input Module                                          | £660       |
| 8121-4002       | 9-66Vdc Inverse, 1.5A, 8 Way Output Module                                   | £878       |
| 8122-4001       | I/O Blanking Panel (Single Width)                                            | £38        |
| 8122-4003       | Central Highway Blanking Panel (Single Width)                                | £58        |
| 8150-4002       | ±10V, 0-20mA, 2 Channel Input Module                                         | £985       |
| 8160-4008       | 2 x 8 bit or 1 x 16 bit, 20kHz ~Bi-phase 2 Way Counter Input                 | £505       |
| 8163-4002       | 24Vdc, 32 Way Input Module                                                   | £385       |
| 8151-4002       | ±10V, 0-20mA, 2 Channel Output Module                                        | £1,122     |
| 8164-4002       | 24Vdc, 0.5A, 32 Way Output Module                                            | £626       |
| 8165-4004       | 16 single or 8 Differential Analogue Input Module                            | £1,529     |
| 8166-4002       | 16 single or 8 Differential Analogue Output Module                           | £1,964     |
| 8174-4004       | Remote I/O Outstation Module                                                 | £1,311     |
| 8177-4001       | 110Vac, 16 Way Input Module                                                  | £626       |
| 8178-4001       | 110Vac, 0.5A, 16 Way Output Module                                           | £712       |
| 8191-4004       | Verification I/O Expander (Converts Verification I/O into 512 bits Basic)    | £1,065     |
| 8197-4002       | 48Vdc, 32 Way Input Module                                                   | £395       |
| 8198-4002       | 48Vdc, 0.5A, 32 Way Output Module                                            | £636       |
| 8199-4001       | Unlatched Relay, 16 Way Output                                               | £709       |
| 8239-4006       | GEM80-400 Processor with maths Co-processor                                  | £4,798     |
| 8239-4008       | GEM80-400 Processor with WorldFIP Fieldbus interface with Maths Co-processor | £5,580     |
| 8239-4016       | GEM80-400 Processor                                                          | £3,106     |
| 8239-4018       | GEM80-400 Processor with WorldFIP Fieldbus Interface                         | £4,025     |
| 8268-4101       | STARNET Communication Module                                                 | £2,236     |
| 8272-4004       | 256k Expansion RAM for IMAGEM/Off line data                                  | £1,459     |
| 8280-4001-Z     | GEMLAN-T TCP/IP Communications Module                                        | £2,700     |
| GLT-ETHERNET    | GEMLAN-T OPC Server & Ethernet Card                                          | £2,995     |
| 8284-4002       | IMAGEM Graphics Display Coprocessor (Traditional)                            | £2,750     |
| 8284-4003       | IMAGEM Graphics Coprocessor – SVGA for CRT                                   | £1,850     |
| 8284-4004       | IMAGEM Graphics Coprocessor – SVGA for TFT and LCD                           | £1,850     |
| 8300-4003       | Fast I/O Driver (Required if connecting to existing Fast I/O)                | £1,348     |
| 8587-4003       | RS485 Termination Panel                                                      | £615       |
| 8855-4110       | GEM80-400 Enhanced Subrack (Metal)                                           | £1,408     |
| 8855-4111       | GEM80-400 Special Subrack (Metal)                                            | £1,490     |
| 8855-4112       | GEM80-400CE Subrack                                                          | £1,550     |
| 8857-4120       | GEM80-400 Standard/GEM80-500/Remote I/O Subrack (Metal)                      | £1,395     |
| 8859-4103       | 12 Slot I/O Subrack for Basic and Verification I/O                           | £1,105     |
| 8870-4979-Z     | GEM80-500 Controller, 40K user instruction, 88-264V ac                       | £1,313     |
| 8870-4979DC24-Z | GEM80-500 Controller, 40K user instruction, 24Vdc supply                     | £1,465     |
| 8870-4979DC48-Z | GEM80-500 Controller, 40K user instruction, 48Vdc supply                     | £1,465     |
| 8890-4142       | I/O Module Plant Connector for 8 way I/O Modules                             | £35        |
| 8890-4144       | I/O Modules Plant Connector for 8177/8 & 9513/14 I/O modules                 | £58        |
| 8890-4600       | I/O Modules Plant Connector the 9543 & 8168 I/O Modules                      | £58        |
| 8890-4611       | I/O Ribbon Cable (4 connectors)                                              | £55        |
| 8890-4640       | GEM80 AGP RS232 Programming Cable – Spare                                    | £56        |

**GEM80 Price List**

| Item           | Description                                                                     | 2010 Price |
|----------------|---------------------------------------------------------------------------------|------------|
| 8890-4705      | Wiring Tray (Fits on the front of the subrack spacer)                           | £56        |
| 8890-4740      | I/O Module Plant Connector for the 8199 I/O Modules                             | £72        |
| 8890-4900      | GEM80-500 Backplate mounting kit (cubicle)                                      | £25        |
| 8890-4910      | Optional Rear mounting kit for metal subracks only                              | £40        |
| 8891-4010      | Voltage Input Termination Rail for Multiplexer                                  | £289       |
| 8891-4014      | Current Input Termination Rail for Multiplexer                                  | £314       |
| 8891-4028      | Termination rail for 2 Channel Input Module                                     | £165       |
| 8891-4026      | Termination rail for 2 Channel Output Module                                    | £160       |
| 8891-4029      | Termination rail for Counter Input Module                                       | £288       |
| 8891-4032      | Termination rail for 2Remote I/O Controller or Outstation                       | £251       |
| 8891-4068      | Cable Harness for 16 Channel Multiplexer                                        | £450       |
| 8891-4077      | 2 Way Serial Link Ribbon Cable                                                  | £51        |
| 8891-4094      | Cable Harness for Remote I/O Controller, Outstation or Analogue and Counter I/O | £56        |
| 8891-4102      | Cable Harness for 8165/8166                                                     | £264       |
| 8891-4395      | Cable Harness for 32 Way Input Modules                                          | £122       |
| 8891-4399      | Cable Harness for 32 Way Output Modules                                         | £122       |
| 8924-0000      | 20mA Termination Panel                                                          | £550       |
| 8975-0000      | RS232 to 20mA Converter (requires a separate ±15v supply                        | £556       |
| 9006-4002      | Remote I/O Controller                                                           | £2,294     |
| 9009-4001      | RS422 to RS232 Convertor                                                        | £518       |
| 9009-4002      | RS232 Termination Panel for STARNET                                             | £525       |
| 9017-4010      | 110/220Vac/dc Power Supply for GEM80-400 Enhanced, Special and CE Subracks      | £2,885     |
| 9020-4001      | RS232/20mA programming Lead                                                     | £182       |
| 9032-4010      | 110/220Vac/dc Power Supply for GEM80-400 Standard Subrack only                  | £1,320     |
| 9291-4004      | RAM Expansion Module for 40,000 instructions                                    | £449       |
| 9291-4024      | EEPROM Expansion Module for 40,000 instructions                                 | £701       |
| 9513-4002      | 24Vdc, 16 Way Input Module                                                      | £608       |
| 9514-4002      | 24Vdc, 0.5A, 16 Way Output Module                                               | £695       |
| 9543-4002      | Relay with Enable, 8 Way Output Module                                          | £498       |
| 9712-4010      | 5 BNC to 15 Way D-type adapter                                                  | £212       |
| 9713-4020      | Basic (256 bits) & Verification (1024) words) I/O sub-module                    | £245       |
| 9713-4021      | Basic I/O sub-module (512 bits)                                                 | £245       |
| 9714-4020      | 2 serial port sub-module, ESP, RS232 or RS485                                   | £398       |
| 9715-4020      | WorldFIP Communications sub-module                                              | £625       |
| 9716-4020-Z    | Ethernet sub-module                                                             | £990       |
| 9717-4020      | GEM80-500 Host Subrack Interface Module                                         | £450       |
| 9720-4020      | GEMTEQ Scanner Module (for use with GEMTEQ I/O)                                 | £350       |
| 9721-4001      | GEM80-500 Auxiliary Power Termination Panel                                     | £80        |
| 9723-4020      | Profibus Master Interface (Requires Ethernet module to be installed)            | £1,396     |
| 9724-4020      | DeviceNet Slave Interface (Requires Ethernet module to be installed)            | £1099      |
| 9727-4020      | Ethernet Adapter (required if no "Z" suffix on existing controller)             | £215       |
| 9730-4012      | GEMTEQ 16 Channel I/P 24V dc                                                    | £354       |
| 9731-4012      | GEMTEQ 16 Channel O/P 24V dc @ 500mA                                            | £354       |
| 9732-4012      | GEMTEQ 16 Channel I/P 110V ac                                                   | £378       |
| 9733-4012      | GEMTEQ 16 Channel O/P 110V ac @ 1A                                              | £496       |
| 9734-4012      | GEMTEQ Analogue 8 I/P + 8 O/P 0-20mA +10v                                       | £515       |
| 9735-4012      | GEMTEQ 16 Channel Relay O/P 3A 250Vac                                           | £528       |
| 9736-4012      | GEMTEQ Counter Module                                                           | £540       |
| 9737-4012      | GEMTEQ Analogue 16 I/P + 8 O/P 0-20mA +10v                                      | £700       |
| GEM80-AGP-PF-P | Advance GEM80 Programmer – Professional Version with Parallel Dongle            | £1,650     |
| GEM80-AGP-PF-U | Advance GEM80 Programmer – Professional Version with USB Dongle                 | £1,650     |
| S20T0319/01    | Battery for GEM80 RAM Card types 8272, 8222 or 8220                             | £61        |
| S20T0319/01    | Battery for 256k RAM Card (8272)                                                | £61        |

| Item        | Description                                                                                                   | 2010 Price |
|-------------|---------------------------------------------------------------------------------------------------------------|------------|
| S41Y8230/10 | Spare +15v power connector assembly (For Sub-Modules)                                                         | £20        |
| S78802/350  | Battery kit for old GEM80-400 Processors with Orange Battery Holder. Kit contains 1 new holder, 1 new battery | £46        |
| S78802/350  | Battery kit for old GEM80-400 Processors with Orange Battery Holder. Kit contains 1 new holder, 1 new battery | £46        |
| S78802/352  | Battery for current GEM80-400 Processors with Grey Battery Holder(Pack of 2 Batteries)                        | £35        |
| S78802/352  | Battery for GEM80-131 & 400 Processors (Pack of 2)*                                                           | £35        |
| T1504       | 12 Slot I/O Subrack User Information                                                                          | £10        |
| T1614       | GEM80-400 Technical Manual                                                                                    | £27        |
| T1653       | GEM80 FIP Interface Manual                                                                                    | £26        |
| T2011       | GEMLAN-T Technical Manual                                                                                     | £10        |
| T2025En     | GEM80-500 Technical Manual                                                                                    | £20        |
| T2031En     | GEM80 GEMTEQ I/O User Manual                                                                                  | £25        |
| T390        | IMAGEM Technical Manual                                                                                       | £29        |
| T438        | Compact I/O Modules (Basic) User Information                                                                  | £10        |
| T445        | Remote I/O and Redundant/Changeover Systems Manual                                                            | £26        |
| T464        | STARNET User Information                                                                                      | £26        |
|             |                                                                                                               |            |
|             |                                                                                                               |            |

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# **Converteam UK Ltd**

## **GEM80**

### **UK Price List**

**September 2009**

## **Commercial Conditions & Customer Support Summary**

**Converteam UK Ltd**  
**West Avenue, Kidsgrove, Staffordshire, ST7 1TW**  
**Tel: +44 (0) 1782 781178 Fax: +44 (0) 1782 781112**  
**Email:- [product.service-uk@converteam.com](mailto:product.service-uk@converteam.com) – [www.converteam.com](http://www.converteam.com)**

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## COMMERCIAL CONDITIONS & CUSTOMER SUPPORT SUMMARY

### General Conditions of Sale – Home (Supply Only)

#### 1. INTRODUCTION

These General Conditions of Sale ("Conditions") shall apply save as varied by express agreement between the parties.

#### 2. DEFINITIONS

- 2.1 "Seller" means Converteam UK Ltd. whose registered office is at Boughton Road, Rugby CV21 1BU, England.
- 2.2 "Contract" means the agreement between Purchaser and Seller (howsoever made) for the Works, including these Conditions.
- 2.3 "Contract Price" means the sum stated in the Contract as the price payable to Seller for the execution of the Works.
- 2.4 "Equipment" means all machinery, apparatus, materials, documentation and articles and things of all kinds to be provided by Seller under the Contract.
- 2.5 "Purchaser" means the person, firm or company so named in the Contract to whom the Equipment is to be supplied and shall include Purchaser's legal personal representatives, successors and permitted assigns.
- 2.6 "Factory Acceptance Tests" means the tests performed on items of the Equipment by Seller at its premises and to its standard test procedures.
- 2.7 "Site" means the place where the Equipment is to be used together with so much of the area surrounding the said place that Seller reasonably needs to use in connection with Seller's performance of its obligations under the Contract.
- 2.8 "Works" means the work carried out by Seller in manufacturing and delivering the Equipment and, when applicable, supervising the installation and commissioning all as set out in the Contract.

#### 3. CONTRACT EFFECTIVENESS

- 3.1 The Contract shall become effective and Seller shall be obliged to commence the Works only when Seller receives Purchaser's acceptance of Seller's tender or the Purchaser has given written instructions to proceed with work that are acceptable to Seller.

#### 4. INFORMATION

- 4.1 Purchaser shall provide Seller with all necessary information that may be reasonably required from time to time to permit Seller to proceed without interruption with the Works. In the event that the Works is delayed or the extent of the Works is increased by reason of delay in the provision by Purchaser of the necessary information or by reason of any change in such information then Seller shall be at liberty to require Purchaser to extend the delivery date by a reasonable period and Purchaser shall so extend the delivery date and all reasonable costs and expenses incurred by Seller as a result of such delay of or increase to the Works shall be paid by Purchaser.
- 4.2 Unless otherwise specified in Seller's tender, all drawings and particulars of weights and dimensions submitted therewith shall be construed as being approximate only.
- 4.3 Seller shall submit to Purchaser during the progress of the Contract within such reasonable times as Purchaser may require such drawings of the general arrangement and details of the Equipment as may be specified in the Contract.
- 4.4 All intellectual property, patents, trademarks, know-how, copyrights, models, formulae, software, source codes, designs, trade secrets and trade names furnished or supplied by Seller (collectively, "Intellectual Property") in connection with the Contract shall remain the exclusive property of Seller. Seller hereby grants Purchaser a non-exclusive licence and right to use the Intellectual Property for the installation, operation and maintenance of the Equipment, but not for the manufacture of any parts. Purchaser shall not disclose, publish, or provide any of the Intellectual Property to any person or entity other than Purchaser's employees and employees of Purchaser's customer with a need to know such information for the installation, operation and maintenance of the Equipment. The provisions of this Sub-Clause 4.4 shall not detract from any rights that Purchaser or its customer may otherwise have to install, operate and maintain the Equipment.

#### 5. TESTS

- 5.1 The Equipment will be submitted to Factory Acceptance Tests (if appropriate) before despatch.

#### 6. DELIVERY

- 6.1 Save as varied by these Conditions the obligations of the parties in relation to the delivery terms specified in the Contract and the rules determining the roles of the parties in respect of delivery and the passing of risk of loss of or damage to the Equipment shall be fixed in accordance with the International Rules for the Interpretation of Trade Terms (Incoterms) of the International Chamber of Commerce in force at the date of the Contract.

- 6.2 Unless otherwise stated in the Contract the Equipment shall be delivered Ex Works (EXW) at place(s) of manufacture.

- 6.3 Title in the Equipment shall pass to Purchaser upon receipt by Seller of the final payment due to Seller under the Contract.

- 6.4 If Seller is unable, by reason of instructions or lack of instructions from Purchaser or for any cause beyond the reasonable control of Seller, to deliver all or any part of the Equipment on the date specified in the Contract then Seller shall be entitled to arrange storage either at its own premises or elsewhere on Purchaser's behalf and all costs and expenses incurred by Seller including (but without limitation) the cost of packing and storage, insurance, demurrage, additional carriage and any re-testing and necessary refurbishing shall be paid by Purchaser. In any case delivery under the Contract shall be deemed to have been completed upon delivery of such Equipment into storage and Purchaser shall make any payment due to Seller on delivery as though delivery has been made and shall pay the balance of the Contract Price (if any) within six months from the date of delivery into storage.

#### 7. WARRANTY

- 7.1 Seller will make good, by repair or by the supply of a replacement, defects which under proper use, care and maintenance appear in the Equipment within a period of 18 calendar months from the date of delivery of the Equipment (the "Warranty Period") and arise solely from faulty design, materials or workmanship excluding any defects caused by design, materials or workmanship furnished by Purchaser; provided always that the defective part has been returned to Seller if Seller so requires. Seller shall refund the reasonable cost of carriage on such returned part and the repaired or new part will be delivered by Seller free of charge as provided in Clause 6 (Delivery).
- 7.2 If during the Warranty Period, a fault in the Equipment occurs and Purchaser is unable to locate it using proper skill and following the fault finding procedures (if any) laid down, Seller will at Purchaser's request locate and rectify the fault for Purchaser. This location and rectification work will be at Seller's cost if the fault was due to Seller's faulty design, materials or workmanship and Purchaser has used proper skill and diligence in attempting to locate the fault. If the fault was due to Seller's faulty design, materials or workmanship but Purchaser has failed to use such proper skill and diligence in locating it then Purchaser will reimburse Seller for all its reasonable costs in visiting the Site and locating the fault.
- 7.3 Seller's liability set forth in this Clause is subject to Purchaser providing without cost to Seller working access to the fault by disassembling, removing, replacing and reinstalling any equipment, product, materials or structures to the extent necessary to permit Seller to perform its obligations.
- 7.4 Seller's liability under this Clause 7 shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose or the workmanship of any part of the Equipment and save as expressed in this Clause 7 Seller shall not be under any liability whether in contract, tort (including but not limited to negligence) or by reason of breach of statutory duty or otherwise in respect of defects or for any damage or loss of whatsoever kind attributable to such defects or from any work done in connection therewith. Nothing in this Clause 7 shall affect the liability of Seller for death or bodily injury caused by the negligence of Seller.

#### 8. EXTRA COSTS

- 8.1 Should Seller incur extra cost owing to Variation or suspension of the Works by Purchaser's instructions or lack of instructions or to interruptions, delays, overtime, unusual hours, mistakes or work for which Seller is not responsible, or to any specified Site facilities and working conditions not being maintained adequately by Purchaser then the Contract Price will be adjusted by such amounts as may be reasonable in all the circumstances.

#### 9. TERMS OF PAYMENT

- 9.1 Payment of the Contract Price (adjusted to give effect to any additions to or deductions there from as are provided for in these Conditions) shall be due upon delivery and shall be paid by Purchaser against presentation by Seller to Purchaser of Seller's simple invoice therefore.
- 9.2 Any other sums payable by Purchaser to Seller under the Contract shall be paid within thirty (30) days of Seller's invoice submitted therefore.
- 9.3 If payment is not made within thirty (30) days of Seller's invoice therefore Seller shall be entitled to receive interest on

the amount unpaid from the day on which payment was due. The interest shall be at the compound rate of one per cent per month. Seller shall be entitled to interest without formal notice and without prejudice to any other right or remedy.

- 9.4 Payments shall not be withheld on account of minor defects or omissions in the Equipment which do not materially affect its use.

#### **10. STATUTORY AND OTHER REGULATIONS**

- 10.1 If the cost to Seller of performing its obligations under the Contract shall be increased or reduced by reason of the making or amendment after the date of Seller's tender of any national or international standards and/or class regulations or any law or of any order, regulation or by-law having the force of law, in the United Kingdom or elsewhere that shall affect the performance of Seller's obligations under the Contract the amount of such increase or reduction shall be added to or deducted from the Contract Price as the case may be.

#### **11. VARIATIONS**

- 11.1 In this Clause 11 the term "Variation" means any alteration of the Works whether by way of addition, modification or omission.
- 11.2 Purchaser shall have the power until the Works has been delivered under Clause 6 (Delivery) to instruct Seller by notice to make any Variation to the Works.
- 11.3 As soon as reasonably possible after having received any such instruction Seller shall notify Purchaser if in Seller's opinion the Variation will involve an addition to or deduction from the Contract Price and/or an extension to the Contract programme.
- 11.4 No such Variation shall become effective until any changes to the Contract Price and/or the Contract programme have been agreed by the parties and confirmed by a written order identified as a Variation Order issued by Purchaser and accepted by Seller.
- 11.5 Nothing in this Clause 11 shall prevent Seller from making proposals to Purchaser for Variations to the Works.

#### **12. DELAY IN DELIVERY**

- 12.1 If Seller fails to deliver the Equipment within the time fixed therefore under the Contract (or any extension thereof provided by Clause 16 (Extension of Time) where relevant) Purchaser shall be entitled to deduct liquidated damages from the Contract Price unless it can be reasonably concluded from the circumstances of the particular case that Purchaser has suffered no loss. Such liquidated damages shall equal 0.5% of that part of the Contract Price which is properly attributable to such portion of the Equipment as cannot in consequence of the said failure be put to the use intended for each complete week of delay commencing on the due date of delivery, but the amount so deducted shall not in any case exceed 5% of the Contract Price. Save only as provided in Sub-Clause 12.2 such deduction from the Contract Price shall be in full satisfaction for Seller's liability for any delay.
- 12.2 If any part of the Equipment in respect of which Purchaser has become entitled to the maximum amount provided under Sub-Clause 12.1 remains undelivered, Purchaser may by notice to Seller require Seller to deliver the same within such time (not being less than 28 days) as Purchaser may specify in the notice. If Seller shall fail to deliver the undelivered Equipment within the time so specified Purchaser shall be entitled, after having given Seller notice of Purchaser's intention to do so, to purchase equipment in place of the undelivered Equipment and there shall be deducted from the Contract Price that part thereof which is properly apportionable to the undelivered Equipment. Seller shall pay to Purchaser any sums by which the expenditure reasonably incurred by Purchaser in obtaining equipment in place of the undelivered Equipment exceeds the sum deducted. All equipment obtained by Purchaser in place of undelivered Equipment shall comply with the Contract and shall be obtained at reasonable prices and where practicable under competitive conditions.

#### **13. LIMITATION OF SELLER'S LIABILITY**

- 13.1 Except claims resulting from death or injury to any person caused by the negligence of Seller (for which no limit applies) and except claims made under the provisions of Sub-Clause 13.2 in no circumstances whatsoever shall Seller's aggregate liability whether by way of indemnity, breach of contract, tort (including but not limited to negligence) or breach of statutory duty exceed 100% of the Contract Price.
- 13.2 If during the performance of the Contract physical loss of or physical damage to material property belonging to Purchaser arises directly from any act or omission by Seller then Seller shall be responsible for making good such loss of or damage to property provided that Seller's total liability for damage to Purchaser's property (including damage caused by Seller's breach of contract, tort or breach of statutory duty) shall not exceed €5,000,000 (Euro Five Million). Seller shall have no liability to Purchaser for or in respect of or in consequence of any loss of or damage to Purchaser's property that shall occur after the expiration of the Warranty Period.

- 13.3 Except as expressly provided in Clause 12 (Delay in Delivery) for the payment of liquidated damages for delay Seller shall not be liable to Purchaser by way of indemnity or by reason of any breach of contract or of statutory duty or by reason of tort (including but not limited to negligence) for any loss of profit, loss of use, loss of production, loss of contracts or for any indirect or consequential damage whatsoever that may be suffered by Purchaser or claimed against it.

#### **14. PATENTS**

- 14.1 Seller will be liable to Purchaser for any claim of infringement of patent, registered design, trade mark or copyright (published at the date of the Contract) caused by the use or sale of the Equipment and for all costs and damages which Purchaser may incur in any action for such infringement or for which Purchaser may become liable in any such action. Provided always that such liability shall not apply (and Purchaser shall be solely responsible for and liable to Seller for all costs and damages which Seller may incur in any action for such infringement or for which Seller may become liable in any such action) to any infringement which is due
- (a) to Seller having followed a design or instructions furnished or given by Purchaser, or
- (b) to the use of such Equipment in a manner or for a purpose not specified by or expressly agreed to by Seller, or
- (c) to the use of the Equipment in association or combination with any other equipment not supplied by Seller, including the method of installation or incorporation of Equipment into Purchaser's or a third party's product and the configuration or topology of any product into which the Equipment is incorporated by Purchaser, or
- (d) to the use, importation or offer for sale of the Equipment in a territory or country which has not been expressly agreed to by Seller.

And provided also that such liability is conditional on Purchaser giving to Seller the earliest possible notice in writing of any claim being made or action threatened or brought against Purchaser and on Purchaser permitting Seller at Seller's own expense to conduct any litigation that may ensue and all negotiations for a settlement of the claim. Purchaser shall not, unless and until Seller shall have failed to take over the conduct of the negotiations or litigation make any admission that might be prejudicial thereto. Purchaser on its part warrants that any design or instructions furnished or given by Purchaser shall not be such as will cause Seller to infringe any patent, registered design, trade mark or copyright in the execution of the Contract.

#### **15. LEGAL CONSTRUCTION**

- 15.1 The Contract shall be governed by and construed in accordance with the Laws of England and shall be subject to the exclusive jurisdiction of the English Courts. However, each of the parties shall have the right to take proceedings in any other jurisdiction for the purposes of enforcing a judgement or order obtained from the courts in England.
- 15.2 The parties do not intend that any third party shall have rights to enforce any part of the Contract and the provisions of the Contracts (Rights of Third Parties) Act 1999 are hereby excluded from the Contract.

#### **16. EXTENSION OF TIME**

- 16.1 Seller may claim an extension of the time for delivery and/or completion if Seller is or will be delayed in delivering the Equipment and/or completing the Works by any of the following causes
- (a) extra or additional work by reason of any Variation ordered,
- (b) adverse weather conditions,
- (c) physical obstructions or conditions which could not reasonably have been foreseen by Seller,
- (d) Purchaser's instructions, otherwise than by reason of Seller's default,
- (e) the failure of Purchaser to fulfil any of Purchaser's obligations under the Contract,
- (f) delay by any other contractor engaged by Purchaser,
- (g) any suspension of the Works under Clause 20 (Suspension), or
- (h) force majeure.
- 16.2 Seller shall give to Purchaser notice of Seller's intention to make a claim for an extension of time within 21 days of the circumstances for such a claim becoming known to Seller. The notice shall be followed as soon as possible by the claim with full supporting details.
- 16.3 Purchaser shall, after due consultation with Seller, grant Seller from time to time, either prospectively or retrospectively, such extension of time for delivery and/or completion as may be justified and is reasonable in the circumstances.
- 16.4 Seller shall be entitled to such extension whether the delay occurs before or after the time for delivery and/or completion.
- 16.5 Seller shall be entitled to claim an extension of time if delay by a supplier to Seller is due to a cause mentioned in Sub-

Clause 16.1 and such delay prevents Seller from meeting the time for delivery and/or completion.

#### **17. FORCE MAJEURE**

17.1 The term "force majeure" means all causes or events beyond the reasonable control of either party which arise after the formation of the Contract and which prevents, delays or hinders the execution of the Contract and including but not limited to war and other hostilities (whether declared or not) invasion, act of foreign enemies, mobilisation, requisition or embargo, rebellion or riot or civil commotion, earthquake, flood, fire or other natural disaster, including exceptional adverse weather, industrial disputes (including disputes affecting subcontractors and suppliers) bankruptcy or liquidation of subcontractors.

17.2 If either party is prevented, delayed or hindered in performing any obligation under the Contract as a result of force majeure, such obligation shall be suspended for so long and to such extent as may be justified by the circumstances.

17.3 If the execution of the Contract has substantially ceased as a result of force majeure circumstances and is not resumed within 180 days either party may by notice given to the other in writing terminate the Contract and Purchaser shall pay such proportion of the Contract Price as the work actually done bears to the work for which the Contract Price was fixed, together with such costs necessarily incurred by Seller in connection with the termination as have not been paid.

#### **18. VAT**

18.1 The Contract Price is exclusive of VAT. Purchaser shall pay to Seller in addition to the Contract price (or any other sum due to Seller) a sum equal to the VAT chargeable on the Works.

#### **19. ASSIGNMENT**

19.1 Neither Purchaser nor Seller shall without the prior written consent of the other (which shall not be withheld unreasonably) assign any benefit under the Contract to any other person except that Seller may without such consent assign either absolutely or by way of charge any money which is or may become due to Seller under the Contract. Seller may subcontract the performance of any of its obligations under the Contract as Seller considers expedient, but no such subcontracting shall relieve Seller from its responsibility for the performance of the Contract.

#### **20. SUSPENSION**

20.1 Without prejudice to any other remedy that Seller has Seller may on giving seven days notice suspend progress of the Works in whole or in part when

(a) any act or omission of Purchaser prevents reasonable progress, or

(b) Purchaser fails to make payment as provided in the Contract, or

(c) Purchaser fails to issue any certificate due under the Contract.

On remedy by Purchaser Seller shall continue the progress of the Works. Purchaser shall pay all Seller's costs arising out of suspension and subsequent resumption of the Works.

#### **21. TERMINATION**

21.1 Seller shall have the right to terminate the Contract if Purchaser is in breach of the Contract and does not rectify such breach within 14 days of receipt of notification thereof in writing.

In the event of such termination Purchaser shall pay to Seller an amount calculated as follows;

(a) the value of the work done,

(b) the amount of any other expenditure which in the circumstances was reasonably incurred by Seller in the expectation of completing the Contract,

(c) the reasonable cost of removal of Seller's equipment from the Site and the return thereof to Seller's premises,

(d) the reasonable cost of repatriation of Seller's staff and workmen employed wholly in connection with the Contract at the date of such termination, and

(e) the amount of any loss or damage, including loss of profit from the Contract that Seller may have suffered in consequence of termination.

#### **22. EXCLUSIVE REMEDIES**

22.1 Where the Contract sets out the specific rights or obligations of either party and provides an express remedy then such remedy shall be in full satisfaction of the rights or obligations that gave rise to the remedy.

#### **23. WAIVER**

23.1 No waiver of any of the terms of the Contract shall be valid unless in writing and signed by authorised representatives of both parties.

Except as otherwise provided, the failure of either party to insist upon strict adherence to any provision of the Contract on any occasion shall not be construed as waiver of any right to insist thereafter upon strict adherence to that provision or any other under the Contract.

#### **24. SEVERABILITY**

24.1 If any provision of the Contract shall be held to be invalid, prohibited or unenforceable for any reason, such provision shall be ineffective to the extent of such invalidity, prohibition or unenforceability, without invalidating the remaining provisions of the Contract or affecting the validity or enforceability of such provision.

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## General Conditions of Sale – Export (Supply Only)

### 1. INTRODUCTION

These General Conditions of Sale ("Conditions") shall apply save as varied by express agreement between the parties.

### 2. DEFINITIONS

- 2.1 "Seller" means Converteam UK Ltd. whose registered office is at Boughton Road, Rugby CV21 1BU, England.
- 2.2 "Contract" means the agreement between Purchaser and Seller (howsoever made) for the Works, including these Conditions.
- 2.3 "Contract Price" means the sum stated in the Contract as the price payable to Seller for the execution of the Works.
- 2.4 "Equipment" means all machinery, apparatus, materials, documentation and articles and things of all kinds to be provided by Seller under the Contract.
- 2.5 "Purchaser" means the person, firm or company so named in the Contract to whom the Equipment is to be supplied and shall include Purchaser's legal personal representatives, successors and permitted assigns.
- 2.6 "Factory Acceptance Tests" means the tests performed on items of the Equipment by Seller at its premises and to its standard test procedures.
- 2.7 "Site" means the place where the Equipment is to be used together with so much of the area surrounding the said place that Seller reasonably needs to use in connection with Seller's performance of its obligations under the Contract.
- 2.8 "Works" means the work carried out by Seller in manufacturing and delivering the Equipment and, when applicable, supervising the installation and commissioning all as set out in the Contract.

### 3. CONTRACT EFFECTIVENESS

- 3.1 The Contract shall become effective and Seller shall be obliged to commence the Works only when all of the conditions precedent for Contract effectiveness specified elsewhere in the Contract have been fulfilled.

### 4. INFORMATION

- 4.1 Purchaser shall provide Seller with all necessary information that may be reasonably required from time to time to permit Seller to proceed without interruption with the Works. In the event that the Works is delayed or the extent of the Works is increased by reason of delay in the provision by Purchaser of the necessary information or by reason of any change in such information then Seller shall be at liberty to require Purchaser to extend the delivery date by a reasonable period and Purchaser shall so extend the delivery date and all reasonable costs and expenses incurred by Seller as a result of such delay or increase to the Works shall be paid by Purchaser.
- 4.2 Unless otherwise specified in Seller's tender, all drawings and particulars of weights and dimensions submitted therewith shall be construed as being approximate only.
- 4.3 Seller shall submit to Purchaser during the progress of the Contract within such reasonable times as Purchaser may require such drawings of the general arrangement and details of the Equipment as may be specified in the Contract.
- 4.4 All intellectual property, patents, trademarks, know-how, copyrights, models, formulae, software, source codes, designs, trade secrets and trade names furnished or supplied by Seller (collectively, "Intellectual Property") in connection with the Contract shall remain the exclusive property of Seller. Seller hereby grants Purchaser a non-exclusive licence and right to use the Intellectual Property for the installation, operation and maintenance of the Equipment, but not for the manufacture of any parts. Purchaser shall not disclose, publish, or provide any of the Intellectual Property to any person or entity other than Purchaser's employees and employees of Purchaser's customer with a need to know such information for the installation, operation and maintenance of the Equipment. The provisions of this Sub-Clause 4.4 shall not detract from any rights that Purchaser or its customer may otherwise have to install, operate and maintain the Equipment.

### 5. TESTS

- 5.1 The Equipment will be submitted to Factory Acceptance Tests (if appropriate) before despatch.

### 6. DELIVERY

- 6.1 Save as varied by these Conditions the obligations of the parties in relation to the delivery terms specified in the Contract and the rules determining the roles of the parties in respect of delivery and the passing of risk of loss of or damage to the Equipment shall be fixed in accordance with the International Rules for the Interpretation of Trade Terms (Incoterms) of the International Chamber of Commerce in force at the date of the Contract.
- 6.2 Unless otherwise stated in the Contract the Equipment shall be delivered Ex Works (EXW) at place(s) of manufacture.
- 6.3 Title in the Equipment shall pass to Purchaser when the Equipment has passed over the ship's rail at the named port of

shipment or at the boarding place, depot or other point of export.

- 6.4 If Seller is unable, by reason of instructions or lack of instructions from Purchaser or for any cause beyond the reasonable control of Seller, to deliver all or any part of the Equipment on the date specified in the Contract then Seller shall be entitled to arrange storage either at its own premises or elsewhere on Purchaser's behalf and all costs and expenses incurred by Seller including (but without limitation) the cost of packing and storage, insurance, demurrage, additional carriage and any re-testing and necessary refurbishing shall be paid by Purchaser. In any case delivery under the Contract shall be deemed to have been completed upon delivery of such Equipment into storage and Purchaser shall make any payment due to Seller on delivery as though delivery has been made and shall pay the balance of the Contract Price (if any) within six months from the date of delivery into storage.

### 7. WARRANTY

- 7.1 Seller will make good, by repair or by the supply of a replacement, defects which under proper use, care and maintenance appear in the Equipment within a period of 18 calendar months from the date of delivery of the Equipment (the "Warranty Period") and arise solely from faulty design, materials or workmanship excluding any defects caused by design, materials or workmanship furnished by Purchaser; provided always that the defective part has been returned to Seller if Seller so requires. Seller shall refund the reasonable cost of carriage on such returned part and the repaired or new part will be delivered by Seller free of charge as provided in Clause 6 (Delivery).
- 7.2 If during the Warranty Period, a fault in the Equipment occurs and Purchaser is unable to locate it using proper skill and following the fault finding procedures (if any) laid down, Seller will at Purchaser's request locate and rectify the fault for Purchaser. This location and rectification work will be at Seller's cost if the fault was due to Seller's faulty design, materials or workmanship and Purchaser has used proper skill and diligence in attempting to locate the fault. If the fault was due to Seller's faulty design, materials or workmanship but Purchaser has failed to use such proper skill and diligence in locating it then Purchaser will reimburse Seller for all its reasonable costs in visiting the Site and locating the fault.
- 7.3 Seller's liability set forth in this Clause is subject to Purchaser providing without cost to Seller working access to the fault by disassembling, removing, replacing and reinstalling any equipment, product, materials or structures to the extent necessary to permit Seller to perform its obligations.
- 7.4 Seller's liability under this Clause 7 shall be in lieu of any warranty or condition implied by law as to the quality or fitness for any particular purpose or the workmanship of any part of the Equipment and save as expressed in this Clause 7 Seller shall not be under any liability whether in contract, tort (including but not limited to negligence) or by reason of breach of statutory duty or otherwise in respect of defects or for any damage or loss of whatsoever kind attributable to such defects or from any work done in connection therewith. Nothing in this Clause 7 shall affect the liability of Seller for death or bodily injury caused by the negligence of Seller.

### 8. EXTRA COSTS

- 8.1 Should Seller incur extra cost owing to Variation or suspension of the Works by Purchaser's instructions or lack of instructions or to interruptions, delays, overtime, unusual hours, mistakes or work for which Seller is not responsible, or to any specified Site facilities and working conditions not being maintained adequately by Purchaser then the Contract Price will be adjusted by such amounts as may be reasonable in all the circumstances.

### 9. TERMS OF PAYMENT

- 9.1 Payment of the Contract Price (adjusted to give effect to any additions to or deductions there from as are provided for in these Conditions) shall be due upon delivery and shall be paid by Purchaser against presentation by Seller to Purchaser of Seller's simple invoice therefore.
- 9.2 Any other sums payable by Purchaser to Seller under the Contract shall be paid within thirty (30) days of Seller's invoice submitted therefore.
- 9.3 If payment is not made within thirty (30) days of Seller's invoice therefore Seller shall be entitled to receive interest on the amount unpaid from the day on which payment was due. The interest shall be at the compound rate of one per cent per month. Seller shall be entitled to interest without formal notice and without prejudice to any other right or remedy.

- 9.4 Payments shall not be withheld on account of minor defects or omissions in the Equipment which do not materially affect its use.
- 10. STATUTORY AND OTHER REGULATIONS**
- 10.1 If the cost to Seller of performing its obligations under the Contract shall be increased or reduced by reason of the making or amendment after the date of Seller's tender of any national or international standards and/or class regulations or any law or of any order, regulation or by-law having the force of law, in the United Kingdom or elsewhere that shall affect the performance of Seller's obligations under the Contract the amount of such increase or reduction shall be added to or deducted from the Contract Price as the case may be.
- 11. VARIATIONS**
- 11.1 In this Clause 11 the term "Variation" means any alteration of the Works whether by way of addition, modification or omission.
- 11.2 Purchaser shall have the power until the Works has been delivered under Clause 6 (Delivery) to instruct Seller by notice to make any Variation to the Works.
- 11.3 As soon as reasonably possible after having received any such instruction Seller shall notify Purchaser if in Seller's opinion the Variation will involve an addition to or deduction from the Contract Price and/or an extension to the Contract programme.
- 11.4 No such Variation shall become effective until any changes to the Contract Price and/or the Contract programme have been agreed by the parties and confirmed by a written order identified as a Variation Order issued by Purchaser and accepted by Seller.
- 11.5 Nothing in this Clause 11 shall prevent Seller from making proposals to Purchaser for Variations to the Works.
- 12. DELAY IN DELIVERY**
- 12.1 If Seller fails to deliver the Equipment within the time fixed therefore under the Contract (or any extension thereof provided by Clause 16 (Extension of Time) where relevant) Purchaser shall be entitled to deduct liquidated damages from the Contract Price unless it can be reasonably concluded from the circumstances of the particular case that Purchaser has suffered no loss. Such liquidated damages shall equal 0.5% of that part of the Contract Price which is properly attributable to such portion of the Equipment as cannot in consequence of the said failure be put to the use intended for each complete week of delay commencing on the due date of delivery, but the amount so deducted shall not in any case exceed 5% of the Contract Price. Save only as provided in Sub-Clause 12.2 such deduction from the Contract Price shall be in full satisfaction for Seller's liability for any delay.
- 12.2 If any part of the Equipment in respect of which Purchaser has become entitled to the maximum amount provided under Sub-Clause 12.1 remains undelivered, Purchaser may by notice to Seller require Seller to deliver the same within such time (not being less than 28 days) as Purchaser may specify in the notice. If Seller shall fail to deliver the undelivered Equipment within the time so specified Purchaser shall be entitled, after having given Seller notice of Purchaser's intention to do so, to purchase equipment in place of the undelivered Equipment and there shall be deducted from the Contract Price that part thereof which is properly apportionable to the undelivered Equipment. Seller shall pay to Purchaser any sums by which the expenditure reasonably incurred by Purchaser in obtaining equipment in place of the undelivered Equipment exceeds the sum deducted. All equipment obtained by Purchaser in place of undelivered Equipment shall comply with the Contract and shall be obtained at reasonable prices and where practicable under competitive conditions.
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- 13.2 If during the performance of the Contract physical loss of or physical damage to material property belonging to Purchaser arises directly from any act or omission by Seller then Seller shall be responsible for making good such loss of or damage to property provided that Seller's total liability for damage to Purchaser's property (including damage caused by Seller's breach of contract, tort or breach of statutory duty) shall not exceed €5,000,000 (Euro Five Million). Seller shall have no liability to Purchaser for or in respect of or in consequence of any loss of or damage to Purchaser's property that shall occur after the expiration of the Warranty Period.
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- 14.1 Seller will be liable to Purchaser for any claim of infringement of patent, registered design, trade mark or copyright (published at the date of the Contract) caused by the use or sale of the Equipment and for all costs and damages which Purchaser may incur in any action for such infringement or for which Purchaser may become liable in any such action. Provided always that such liability shall not apply (and Purchaser shall be solely responsible for and liable to Seller for all costs and damages which Seller may incur in any action for such infringement or for which Seller may become liable in any such action) to any infringement which is due
- (a) to Seller having followed a design or instructions furnished or given by Purchaser, or
- (b) to the use of such Equipment in a manner or for a purpose not specified by or expressly agreed to by Seller, or
- (c) to the use of the Equipment in association or combination with any other equipment not supplied by Seller, including the method of installation or incorporation of Equipment into Purchaser's or a third party's product and the configuration or topology of any product into which the Equipment is incorporated by Purchaser, or
- (d) to the use, importation or offer for sale of the Equipment in a territory or country which has not been expressly agreed to by Seller.
- And provided also that such liability is conditional on Purchaser giving to Seller the earliest possible notice in writing of any claim being made or action threatened or brought against Purchaser and on Purchaser permitting Seller at Seller's own expense to conduct any litigation that may ensue and all negotiations for a settlement of the claim. Purchaser shall not, unless and until Seller shall have failed to take over the conduct of the negotiations or litigation make any admission that might be prejudicial thereto. Purchaser on its part warrants that any design or instructions furnished or given by Purchaser shall not be such as will cause Seller to infringe any patent, registered design, trade mark or copyright in the execution of the Contract.
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- 15.1 The Contract shall be governed by and construed in accordance with the Laws of England and shall be subject to the exclusive jurisdiction of the English Courts. However, each of the parties shall have the right to take proceedings in any other jurisdiction for the purposes of enforcing a judgement or order obtained from the courts in England.
- 15.2 The parties do not intend that any third party shall have rights to enforce any part of the Contract and the provisions of the Contracts (Rights of Third Parties) Act 1999 are hereby excluded from the Contract.
- 15.3 The provisions of the United Nations Convention on Contracts for the International Sale of Goods ("The Vienna Convention") are hereby excluded from the Contract.
- 16. EXTENSION OF TIME**
- 16.1 Seller may claim an extension of the time for delivery and/or completion if Seller is or will be delayed in delivering the Equipment and/or completing the Works by any of the following causes
- (a) extra or additional work by reason of any Variation ordered,
- (b) adverse weather conditions,
- (c) physical obstructions or conditions which could not reasonably have been foreseen by Seller,
- (d) Purchaser's instructions, otherwise than by reason of Seller's default,
- (e) the failure of Purchaser to fulfil any of Purchaser's obligations under the Contract,
- (f) delay by any other contractor engaged by Purchaser,
- (g) any suspension of the Works under Clause 20 (Suspension), or
- (h) force majeure.
- 16.2 Seller shall give to Purchaser notice of Seller's intention to make a claim for an extension of time within 21 days of the circumstances for such a claim becoming known to Seller. The notice shall be followed as soon as possible by the claim with full supporting details.
- 16.3 Purchaser shall, after due consultation with Seller, grant Seller from time to time, either prospectively or retrospectively, such extension of time for delivery and/or completion as may be justified and is reasonable in the circumstances.
- 16.4 Seller shall be entitled to such extension whether the delay occurs before or after the time for delivery and/or completion.
- 16.5 Seller shall be entitled to claim an extension of time if delay by a supplier to Seller is due to a cause mentioned in Sub-Clause 16.1 and such delay prevents Seller from meeting the time for delivery and/or completion.



**17. FORCE MAJEURE**

17.1 The term "force majeure" means all causes or events beyond the reasonable control of either party which arise after the formation of the Contract and which prevents, delays or hinders the execution of the Contract and including but not limited to war and other hostilities (whether declared or not) invasion, act of foreign enemies, mobilisation, requisition or embargo, rebellion or riot or civil commotion, earthquake, flood, fire or other natural disaster, including exceptional adverse weather, industrial disputes (including disputes affecting subcontractors and suppliers) bankruptcy or liquidation of subcontractors.

17.2 If either party is prevented, delayed or hindered in performing any obligation under the Contract as a result of force majeure, such obligation shall be suspended for so long and to such extent as may be justified by the circumstances.

17.3 If the execution of the Contract has substantially ceased as a result of force majeure circumstances and is not resumed within 180 days either party may by notice given to the other in writing terminate the Contract and Purchaser shall pay such proportion of the Contract Price as the work actually done bears to the work for which the Contract Price was fixed, together with such costs necessarily incurred by Seller in connection with the termination as have not been paid.

**18. TAXES, DUTIES AND LEVIES**

18.1 The Contract Price is exclusive of all customs duties, import charges, VAT (or GST) on importation or on supply, corporate income tax, withholding taxes, personal income tax on expatriates, business tax, sales tax, stamp duty, social security charges and other levies, duties and taxes of any nature, present and future, that may be levied on the Seller or its subcontractors in connection with the performance of the Contract or upon the importation of equipment.

18.2 Should for any reason whatsoever the Seller become liable for the payment of any such duties, charges, taxes or levies it is agreed by the parties that the Contract Price shall be increased accordingly in order to include the amount of such duties, charges, taxes and levies.

**19. ASSIGNMENT**

19.1 Neither Purchaser nor Seller shall without the prior written consent of the other (which shall not be withheld unreasonably) assign any benefit under the Contract to any other person except that Seller may without such consent assign either absolutely or by way of charge any money which is or may become due to Seller under the Contract. Seller may subcontract the performance of any of its obligations under the Contract as Seller considers expedient, but no such subcontracting shall relieve Seller from its responsibility for the performance of the Contract.

**20. SUSPENSION**

20.1 Without prejudice to any other remedy that Seller has Seller may on giving seven days notice suspend progress of the Works in whole or in part when

(a) any act or omission of Purchaser prevents reasonable progress, or

(b) Purchaser fails to make payment as provided in the Contract, or

(c) Purchaser fails to issue any certificate due under the Contract.

On remedy by Purchaser Seller shall continue the progress of the Works. Purchaser shall pay all Seller's costs arising out of suspension and subsequent resumption of the Works.

**21. TERMINATION**

21.1 Seller shall have the right to terminate the Contract if Purchaser is in breach of the Contract and does not rectify such breach within 14 days of receipt of notification thereof in writing.

In the event of such termination Purchaser shall pay to Seller an amount calculated as follows;

(a) the value of the work done,

(b) the amount of any other expenditure which in the circumstances was reasonably incurred by Seller in the expectation of completing the Contract,

(c) the reasonable cost of removal of Seller's equipment from the Site and the return thereof to Seller's premises,

(d) the reasonable cost of repatriation of Seller's staff and workmen employed wholly in connection with the Contract at the date of such termination, and

(e) the amount of any loss or damage, including loss of profit from the Contract that Seller may have suffered in consequence of termination.

**22. EXCLUSIVE REMEDIES**

22.1 Where the Contract sets out the specific rights or obligations of either party and provides an express remedy then such remedy shall be in full satisfaction of the rights or obligations that gave rise to the remedy.

**23. WAIVER**

23.1 No waiver of any of the terms of the Contract shall be valid unless in writing and signed by authorised representatives of both parties.

Except as otherwise provided, the failure of either party to insist upon strict adherence to any provision of the Contract on any occasion shall not be construed as waiver of any right to insist thereafter upon strict adherence to that provision or any other under the Contract.

**24. SEVERABILITY**

24.1 If any provision of the Contract shall be held to be invalid, prohibited or unenforceable for any reason, such provision shall be ineffective to the extent of such invalidity, prohibition or unenforceability, without invalidating the remaining provisions of the Contract or affecting the validity or enforceability of such provision.

**25. WORK IN TERRITORY**

25.1 If at any time any work related to the Equipment (including, but not limited to, local supply of parts of the Equipment, supervision of installation, commissioning) is to be undertaken within the territory where the Site is located then at Seller's request, Purchaser shall place purchase orders for such work with a local company nominated by Seller, upon terms and conditions to be agreed.

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## **General Commercial Conditions (International and UK)**

### **Instruction Manuals**

Where a product is normally supplied with an Instruction Manual then this will be printed in English. Further copies are available at an extra cost.

### **Factored Items**

**CONVERTEAM** operates an ISO 9001/BS 5750 Part 1 Quality Management System. Some of the items quoted may not have been manufactured by **CONVERTEAM**. They have been selected for their ability to complement other products supplied and to meet our exacting standards of product quality but nonetheless, may not originate from an ISO 9000/BS 5750 quality assured source. Information relating to the certification of our suppliers changes with time. If you have any queries relating to the source of supply, please consult our price list or contact our sales department.

### **Despatch**

Please refer to **CONVERTEAM** for estimated despatch periods for all goods in this Price List.

### **Information and Product Change**

**CONVERTEAM** are committed to a process of continuous improvement and therefore information, features and performance of products and technical manuals are liable to change without prior notice. Technical information is given in good faith but without prejudice. **CONVERTEAM** can not underwrite or guarantee the integrity or performance of the complete system or process to which the products are applied.

### **General**

**CONVERTEAM** policy is one of continual development. Products supplied and prices charged may differ from those listed within the Product Service Centre Price Lists.

### **Minimum order charge**

Orders for products are subject to a minimum order charge of £250 (+ VAT)

### **Cancellation Charges**

If an order is cancelled or the quantities substantially reduced then cancellation charges will apply. The cancellation charges will represent the value of components purchased plus the labour expended up to the time of cancellation/change of order.

### **List prices**

The prices quoted in all the Product Service Centre Price Lists are List prices with no discounts applied. All prices exclude delivery charges.

### **Validity**

The latest edition of all price lists supersedes all previous issues. **CONVERTEAM** policy is one of continual development. Products supplied and prices charged may differ from those listed within the price lists.

### **VAT**

VAT is not included and is charged at the prevailing rate where applicable.

## Warranty Procedure

1. Customer to issue a covering Order Number to **CONVERTEAM** to cover the inspection and test of the faulty item(s), and obtain a **Returns Number** from the Regional Business Centre - Kidsgrove before returning any item.
2. Send as much fault information as possible with the returned item - ideally use **CONVERTEAM** form K5017.
3. Once the unit has been inspected and tested and it has been determined that it is a genuine product failure then the equipment will be replaced or repaired at our discretion and the Customer will not be charged.
4. In the event that it is determined that a product failure is not covered under the warranty, customer will be advised of the repair/replacement costs and requested for formal instructions to proceed.
5. In all cases of product misuse or misapplication (as determined by **CONVERTEAM**) then the warranty claim will be invalid and the full replacement cost will become payable.
6. The warranty claim is between the **CONVERTEAM** and the customer who purchased the original item. If you have purchased the item via a distributor or other third party then your claim is with them.

## New Products and Versions

As a supplier of standard products **CONVERTEAM** will supply the version of a product which is available at the time of shipping. We also operate a first in, first out stores system.

This means that:

- a) A single shipment may contain products of different versions when remaining stock of one version is less than the quantity to be shipped.
- b) Shipments on different days may contain different versions.

As a matter of policy we maintain the highest level of forward and backward compatibility possible and the majority of upgrades are firmware upgrades. As a result, customers should not be concerned about using a mixture of versions unless their application requires new facilities that are only available in a later version than that of the product received.

Where a customer has ordered product based on the availability of such new facilities and has received new product of an earlier version **CONVERTEAM** will upgrade the item(s) free of charge.

Upgrade of products already in service will be chargeable.

All price listed products subject to upgrade will be shipped with documentation, which details the changes and any compatibility issues.

## **Spares**

Requests/Orders for spares for in-service equipment must be accompanied by full details of the product(s) for which it is a spare e.g.:

- Part Number including version letter (where applicable)
- Revision (if there is one)
- Serial Number

All of these are found on the product label and will enable us to advise on any compatibility issues.

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## **Customer Support**

### **Product Sales**

Please contact the following for assistance in answering your queries regarding our products.

Tel: 01782 781178  
Fax: 01782 781112 F.A.O. PRODUCT SALES

### **Help Lines**

Please contact the following for assistance in answering your technical/application queries regarding our products.

Tel: 01782 781111  
Fax: 01782 781112 F.A.O. TECHNICAL SUPPORT

Web sites:

[www.gem80.com](http://www.gem80.com)

### **Breakdown and Maintenance Service**

**CONVERTEAM** Regional Business Centres can offer a Maintenance Contract facility which provides 24 hour 7 day per week Breakdown and Routine Service. For further information please contact:-

Tel: 01782 781111  
Fax: 01782 781112 F.A.O. Regional Business Centre

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## Product Failure Notification

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                        |       | <b>End User Details</b>                                                                                                                                                                                             |
| Address:                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       | Name:                                                                                                                                                                                                               |
| Fax No:                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       | Address:                                                                                                                                                                                                            |
| Tel No:                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Date: | Fax No:                                                                                                                                                                                                             |
| Ship to Address (if different to above):                                                                                                                                                                                                                                                                                                                                                                                                                         |       | Tel No:                                                                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       | Application Detail                                                                                                                                                                                                  |
| <b>Description of Item</b><br>PCB/Unit Type:                                                                                                                                                                                                                                                                                                                                                                                                                     |       | <b>Distributor Engineer's Fault Report</b><br>Fault Description:                                                                                                                                                    |
| Serial No:                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |                                                                                                                                                                                                                     |
| Description:                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |                                                                                                                                                                                                                     |
| System Type:<br>Fault occurs when (please tick)<br>Hot <input type="checkbox"/> Cold <input type="checkbox"/> Ambient <input type="checkbox"/><br>Type of Fault (please tick) Hard <input type="checkbox"/> Intermittent <input type="checkbox"/><br>Time between failures _____ hours/minutes<br>Fault Code displayed _____                                                                                                                                     |       | <b>Fault Finding Procedure Followed:</b>                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       | <b>Engineer's Diagnoses &amp; Conclusions:</b>                                                                                                                                                                      |
| <b>Goods Returned/Requested (please tick)</b><br>Warranty <input type="checkbox"/> Sales Order No. supplied on _____<br>Non Warranty <input type="checkbox"/> Please give Order Number _____<br>Service Contract <input type="checkbox"/> Please give Order Number _____<br>For Credit <input type="checkbox"/> Credit returns must have approval before return<br><br><b>IMPORTANT : ALL RETURN ITEMS MUST BE ACCOMPANIED BY A VALID CUSTOMER ORDER NUMBER.</b> |       | Engineer's Name: _____ (Print)<br>Engineer's Signature:<br>Date Repair Completed: _____                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       | <b>Customer Satisfaction Report:</b> For Warranty Items<br>I, name _____<br>Signature _____ Date _____<br>Acknowledge that the product failure repair referred to on this report has been satisfactorily completed. |
| <b>CONVERTEAM USE ONLY</b> Copy to Development                                                                                                                                                                                                                                                                                                                                                                                                                   |       | PRODUCT RETURN NUMBER                                                                                                                                                                                               |
| Credit Note Authorisation: Date _____<br>Approved by:<br>Name: _____<br>Signature: _____ Date _____                                                                                                                                                                                                                                                                                                                                                              |       | Please contact Product Service Centre. for Product Return No. Tel: (01782) 781178.<br>Returned goods will not be accepted without a valid Product Return No. & copy of this form.                                   |

**K5017.9**

## **Converteam UK Ltd**

West Avenue, Kidsgrove  
Staffordshire, ST7 1TW  
Tel: +44 (0) 1782 781000  
Fax: +44 (0) 1782 781001

### **UK Regional Business Centres**

#### **Kent**

Unit 2, The Courtyard, Campus Way,  
Gillingham Business Park, Gillingham, Kent  
Tel: 01732 874515 Fax: 01732 874575

#### **Middlesbrough**

4A Brighthouse Business Village, Riverside Park,  
Middlesbrough, Cleveland, TS2 1RT  
Tel: 01642 254280 Fax: 01642 254287

#### **Rugby**

Boughton Road, Rugby, Warwickshire, CV21 1BU  
Tel: 01788 563217 Fax: 01788 563765

#### **Sheffield**

Newton Business Centre, Thorncliffe Park,  
Chapelton, Sheffield, S35 2PH  
Tel: 0114 240 1912 Fax: 0114 240 1981

#### **Stoke-on-Trent**

West Avenue, Kidsgrove, Stoke-on-Trent,  
ST7 1TW  
Tel: 01782 781111 Fax: 01782 781112

#### **Swansea**

Clyne House, Charter Court, Phoenix Way,  
Swansea, SA7 9ES  
Tel: 01732 563217 Fax: 01732 794069

### **International**

#### **Canada**

Converteam Inc  
845 Harrington Court, Burlington, Ontario, L7N 3P3  
Tel: 905 333 2008 Fax: 905 333 4941/2

#### **USA**

Converteam Inc  
610 Epsilon Drive  
Pittsburgh, PA 15238  
Tel: +1 412 967 0765 Fax: +1 412 967 7660



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