Pennant

World-class products & services

OVERVIEW

Pennant International Group is a leading, worldwide provider of training technology solutions, Integrated Product Support (IPS) software, and support services to the Defence, Aerospace, and safety critical industries. Pennant's capability is provided around the world to train the next generation of operators and maintainers in defence and regulated civilian sectors.

The Pennant Group has grown significantly over the years, through a combination of organic growth (product and customer development) and the acquisitions of Track Access Services (TAS) and Absolute Data Group (ADG). In addition to our operational centres worldwide, the Group has collaborative arrangements with a strategic range of partners in many countries across the globe. Defence forces and contractors form the majority of the current business customer base, but new markets are being developed in civil operations, including information technology and telecommunications.

Our capability in the design, development, manufacture, delivery and support of technical training solutions and services includes:

- Basic hand skills devices, virtual reality trainers & maintenance emulators for regulated sectors

- Alignment with training regulations such as EASA/EMAR PT 66, FAA, City & Guilds & CASA MEA

- Translating and developing a training requirement into a deliverable product

- Providing subject matter expertise in specialist and technical areas

- Operator and maintainer training within an engineering or related environment

- Hardware and software capabilities

- Through Life Support & Services (Integrated Logistics Support)

Pennant's solution offers cost-savings, improved safety outcomes, training in a safe environment and highly skilled, professional documentation and visuals.

> **It's exciting being part of a company which has seen large global growth, building upon our vision of 'one company, one solution' to fulfil the end-to-end needs of our customers.**
>
> **Philip Walker, Group CEO**

HISTORY

Pennant International Limited was established over 60 years ago.

Founded in 1958, Pennant has evolved over the past six decades, from modest beginnings, into a market-leading technology-led business with a truly global customer base.

With offices worldwide, the Group operates principally in the areas of civil and military aviation, defence and rail with customers including global defence primes, government departments, overseas aviation colleges, and rail operators.

Pennant has a diverse portfolio of training technology solutions and integrated product support capabilities that enables it to offer a wide range of solutions to both the defence and regulated civilian sectors and is ideally placed to take advantage of the trends outlined above.

The Company was admitted to trading on the AIM market in 1998 and has traded as a public company ever since.

Pennant has embraced emerging technologies, growing substantially and working on larger contracts, producing ever more sophisticated software solutions including emulations and the OmegaPS LSA product suite.

In 2019, Pennant completed the acquisition of Track Access Services, continuing the strategic expansion and further strengthening Pennant's offering to the rail sector, and in 2020, the Absolute Data Group (ADG) acquisition brings an end-to-end IPS/ILS solution to the industry with the robust S1000D R4i software suite.

Today, Pennant has become a firmly established world leading supplier of IPS solutions from LSA, Technical Publications, to training products, and services, supported by a global innovative team.

OUR MARKETS

Pennant collaborates and delivers to a range of partners and customers across the globe, supporting the following sectors:

- DEFENCE
- RAIL
- AEROSPACE
- SAFETY CRITICAL INDUSTRIES

The Group's global presence allows Pennant to fulfil the end-to-end needs of our international customers. Pennant is a proud member of the following groups and associations:

OUR VISION

To be a global world-class provider of training technology, Integrated Product Support software and associated services.

▼ **INNOVATION -** Make World Class Products

▼ **CUSTOMER FOCUS -** Provide Excellent Services

▼ **DIVERSIFICATION -** Grow Civil

▼ **CORPORATE DEVELOPMENT -** New Markets, New Ventures

OUR STRATEGY OBJECTIVES & ACTION

STRATEGIC OBJECTIVES

1 Continuously review and enhance the Group's product range

2 To grow and improve our service offering

3 Accelerate the Group's presence in civilian training and regulated engineering markets

4 Expand the Group's business in innovative ways

OUR STRATEGY IN ACTION

Completion of the Basic Helicopter Maintenance Trainer (BHMT)

Acquisition and integration of R4i software suite
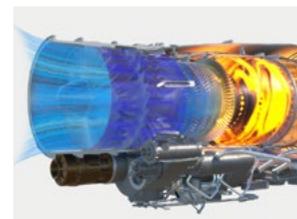

Completion of the Generic Stores Loader Trainer (GSLT)
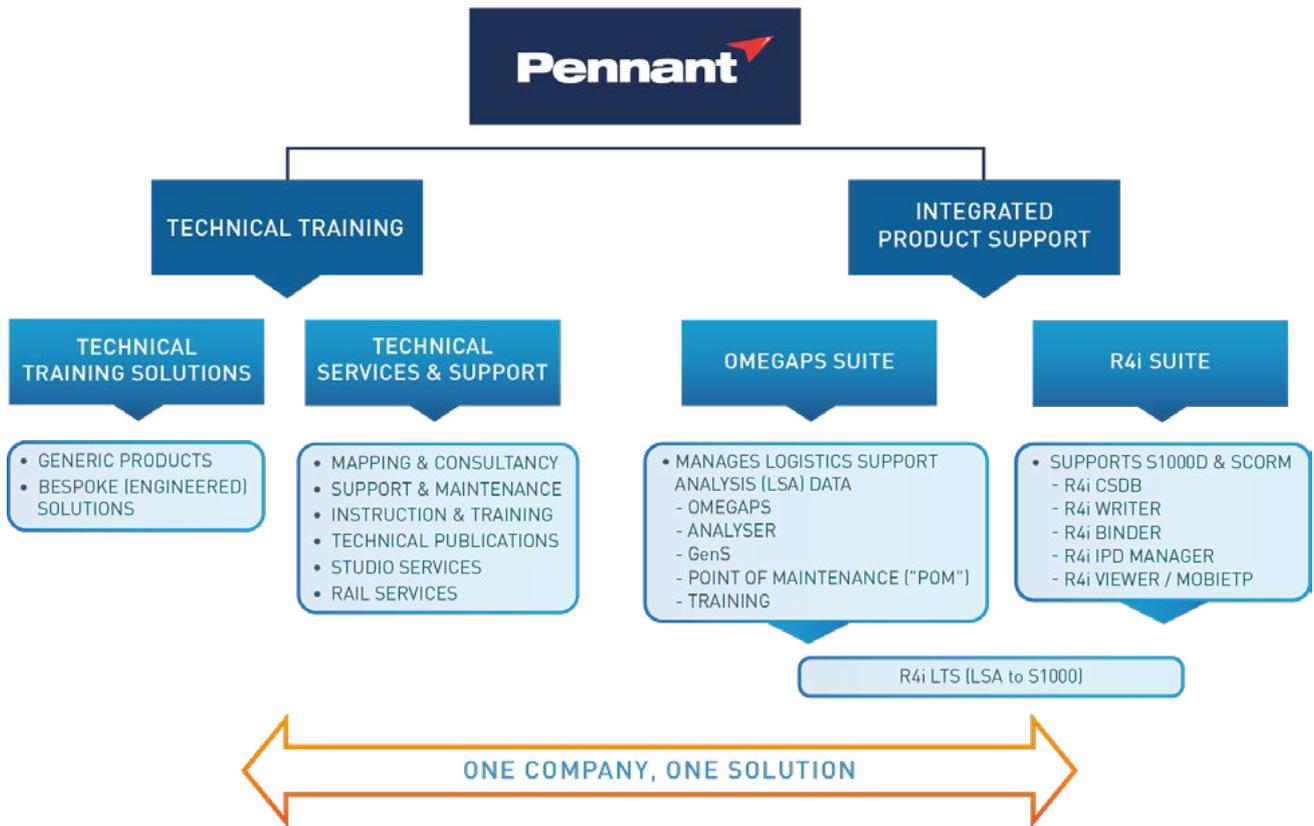

Pennant Customer Care Portal

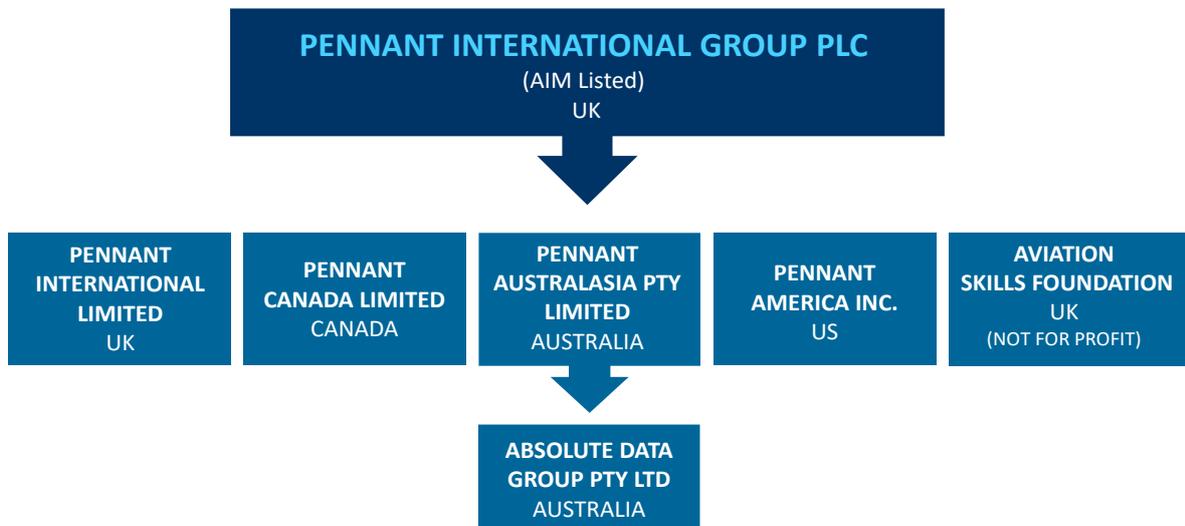New GenS product launched at the User Forum

Release of the Engine Starting System Trainer (ESST)

OUR CAPABILITIES

Pennant

TECHNICAL TRAINING

INTEGRATED PRODUCT SUPPORT

TECHNICAL TRAINING SOLUTIONS
- GENERIC PRODUCTS
- BESPOKE (ENGINEERED) SOLUTIONS

TECHNICAL SERVICES & SUPPORT
- MAPPING & CONSULTANCY
- SUPPORT & MAINTENANCE
- INSTRUCTION & TRAINING
- TECHNICAL PUBLICATIONS
- STUDIO SERVICES
- RAIL SERVICES

OMEGAPS SUITE
- MANAGES LOGISTICS SUPPORT ANALYSIS (LSA) DATA
  - OMEGAPS
  - ANALYSER
  - GenS
  - POINT OF MAINTENANCE ("POM")
  - TRAINING

R4i SUITE
- SUPPORTS S1000D & SCORM
  - R4i CSDB
  - R4i WRITER
  - R4i BINDER
  - R4i IPD MANAGER
  - R4i VIEWER / MOBIETP

R4i LTS (LSA to S1000)

ONE COMPANY, ONE SOLUTION

GROUP STRUCTURE

PENNANT INTERNATIONAL GROUP PLC
(AIM Listed)
UK

| PENNANT INTERNATIONAL LIMITED UK | PENNANT CANADA LIMITED CANADA | PENNANT AUSTRALASIA PTY LIMITED AUSTRALIA | PENNANT AMERICA INC. US | AVIATION SKILLS FOUNDATION UK (NOT FOR PROFIT) |

ABSOLUTE DATA GROUP PTY LTD
AUSTRALIA

OUR FACILITIES

The Pennant worldwide team of approximately 180 are an innovative and ambitious group that intends to change how training solutions, technical software and services are sold and delivered to Aerospace, Defence and Civil markets.

Our staff work across sites in the United Kingdom, North America, Middle East and Australasia. Our facilities have grown substantially over the years and now contain over 60,000 sq.ft of production capacity,

Pennant's head office is based in **Cheltenham UK,** featuring units, production space, demo suite and modern offices. Pennant also has UK offices in **Manchester**, where the Studio Services team are based, and **Fareham**, where our Integrated Product Support team work alongside colleagues at the office in **Ottawa, Canada** and in **Pennsylvania, USA.** Rail and transportation specialists Track Access Services (TAS) are based in **Hertfordshire, UK**.

In Australia, Pennant has three offices: **Brisbane** (Australasia head office), **Melbourne** and **Wagga Wagga**, with an additional engineering site at the Wagga Wagga RAAF base.

180
EMPLOYEES

60,000
SQ FT IN UK
FACILITES

Ottawa, Canada

Pennant Australia - Brisbane

Pennant Australia - Wagga, Wagga

Pennant Australia - Melbourne

Manchester, UK

Hertfordshire, UK

Fareham, UK

Head Office - Cheltenham, UK

TECHNICAL TRAINING SOLUTIONS

Pennant specialise in generic and engineered (platform specific) solutions based on real or simulated military equipment interfaced with simulation computers and instructor control facilities.

From innovative hardware solutions, to dynamic software, technical publications, consultancy and long-term support and maintenance, Pennant's technical training division offers leading solutions, services and support to the Defence, Aerospace, Rail and safety critical industries across the globe.

GENERIC TRAINERS

Pennant's range of generic training equipment offers a blended solution enabling ab-initio students to benefit from a suite of state of the art, modern training aids, which provide operation and maintenance training in a secure training environment before students feel capable and confident to transfer onto real-life equipment, building confidence and developing the necessary hand skills.

- The equipment is used at engineering colleges and academies around the world to support both military and civil specific training

- Our Generic Trainers have been developed to support the practical elements within engineering courses and covers such topics as basic hand skills though to fault diagnostics of large complex systems

- Aligned to EASA / EMAR, FAA, City & Guilds and CASA MEA unit compliant organisations

- Training aids supplement student training by providing practical and theoretical solutions from basic hand-skills through to complex synthetic simulators

- Aimed at providing a realistic training environment but with large scale throughput using "benign" Training Aids

ENGINEERED SOLUTIONS

In addition to the suite of generic training products, Pennant has an experienced team of hardware and software engineers that analyse, design and manufacture bespoke engineering solutions to satisfy training needs.

- Bespoke engineering solutions developed in line with Customers requirements

- This equipment can be platform specific or custom-built, and can include simulators, part-task trainers and procedural trainers for both defence and civil customers.

- Training device enable trainees to become competent and confident prior to advancing to fully immersive simulator or live equipment.

- Significant cost saving benefits by reducing the time operational equipment is out of service for training purposes and limiting the time required in mission simulators
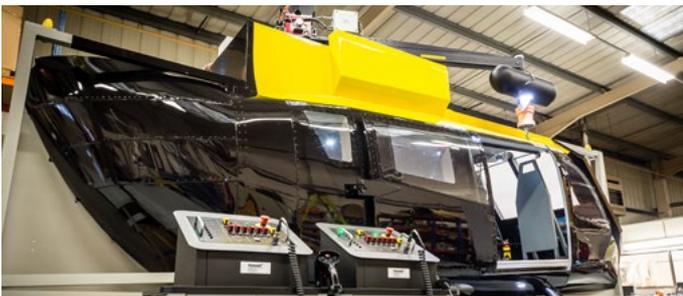
EMULATION AND SIMULATION

Simulators and emulators provide the opportunity for recruits to train on equipment or systems with which they can interact (to a lesser or greater degree) as they would with the real equipment or systems.

▼ Benefits include minimising the time the real equipment is offline for training duties and avoiding the possibility of damaging or catastrophic accidents.

▼ Trainees become confident and competent

▼ Suitable for in-class or remote learning
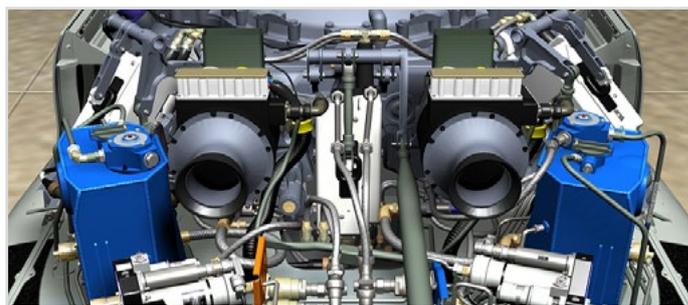
VIRTUAL REALITY TRAINING

Increasingly, training establishments are relying on virtual reality to transition between theoretical and practical exercises in procedural training. With a suite of impressive solutions, Pennant delivers innovative, effective and high-quality training which allows multiple users to inject real-time faults, practice emergency solutions, record responses and review activity easily and safely.

▼ Pennant's VR product combines high fidelity 3D media, the latest Head-Mounted Display (HMD) technology and motion tracking techniques

▼ VR provides a fully immersive training experience that is expected from real world, but in a danger-free environment

▼ Reduces the cost of using real-life equipment & reduces maintenance costs

▼ Easily portable and suitable for training at multiple locations

TECHNICAL SERVICES & SUPPORT

Pennant takes a "Through Life Support" approach to Technical Services and Support for both Pennant and third party training systems in the regulated sectors. From TNA Development to final disposal, Pennant can plan, implement and manage every stage of your support life cycle.

TECHNICAL SERVICES & SUPPORT - CAPABILITIES

Our capabilities include:

- Training Needs Analysis (TNA)
- Courseware Development
- Technical Publications, IETMS, S1000D etc.
- Facilities Planning
- Competency Mapping to EASA, EMAR, City of Guilds etc.

- In Service Support, Preventative and Corrective Maintenance
- Instruction and Training
- Consultancy
- Spares and Obsolescence Management
- Dismantling and Disposal

Our dedicated support services department has a core level of qualified and experienced engineers, providing us with the skills and knowledge to establish Pennant's reputation for delivering highly professional, reliable and cost-effective customer support services. Pennant's proven track record in providing support services across a wide range of training solutions. When Pennant design new equipment the support and training requirements are a major consideration.

CASE STUDY - AVIATION TECHNICAL TRAINING (RAAF BASE WAGGA)

2012 Embedded with Customer to develop TNA

2013 Contract Award (Rolling Annual Contract)

- Refurbished existing Training Aids

- HazMat Remediation - Disposed of obsolete equipment

- Delivered modern training aids, Pennant & third party

- Created instructor and student resource (Media)

2014 Support of 4,000+ items of training equipment from hand tools to ground run aircraft

2016 Created over 100 instructional videos, from hand skills to aircraft movements

2017 Provided Instructor and Developer resource

2018 Mapping to MEA training requirements and development of type training

2019 Supporting the introduction of new airframes

2020 Undertaking deep maintenance and product refresh

2021 Provision of instructors due to significant increase in student throughput

- Introduction of new Training Aids

- Training Aid refresh program

INTEGRATED PRODUCT SUPPORT (IPS)

The Pennant IPS Software brands OmegaPS, Analyzer, GenS and R4i have a well-known presence in the LSAR and S1000D market across the globe and across industries, including Defence (Land, Sea and Air programs), Aerospace, Airlines, Space and to a smaller degree in Mining truck manufacturing. Our first customers were a Defence programs and since then we have been highly recognised for our strengths in military and civilian air programs.

We additionally work with OEM/ Primes and all tier levels in the supply chain of air manufacturing.

With the combined knowledge of our innovative team, our capabilities continue to expand as we evolve. Our resources come with decades of aerospace industry experience that allows us as a team to continue to expand on the following capabilities:

- S1000D Technical Software Development
- LSA Software Development
- ILS/IPS Capabilities with end-to-end solutions
- Configuration Management
- Technical Publications Management

- Technical Writing and Illustrating Services
- S1000D/LSAR Industry Experts to provide Training and Consulting
- Legacy Data Conversion
- Process Improvement

OMEGAPS SOFTWARE

Pennant's IPS OmegaPS software is a world-class suite of software tools to assist Integrated Logistics Support (ILS) / Integrated Product Support (IPS) practitioners in development of cost-effective product support solutions, using a range of international ILS/IPS standards.

OmegaPS is the LSA software widely used by the Australian Department of Defence, Canadian Department of National Defence and many Defence Industry primes globally. This trusted solution provides the ability to perform LSA to any of the various international and Defence specific LSA Standards. For organisations considering the move to the ASD suite of 'S' Series specifications, OmegaPS is currently 85% compliant with S2000M, S3000L and S4000P. This stands well with Defence Departments currently considering the move to the ASD suite of ILS Specifications. In support of the OmegaPS software suite and to continue the consistency of the ASD ILS Specifications, OmegaPS and the S1000D software suite, R4i is integrated so that the export of technical data from the OmegaPS software can be used as the source of truth for the development of S1000D compliant Interactive Electronic Technical Publications (IETP) in support of maintenance and training activities.

The OmegaPS suite provides a unique capabilities to include:

- Enterprise LSAR and LSA solution set for global defence industries to validate integrated product support data and to transform that data for use in multiple defence systems
- Structures integrated product support data to meet a wide range of international standards and S-Series specifications
- Seamlessly integrates LSAR data with the world leading S1000D R4i software suite

The core OmegaPS application includes all data elements and reporting functionality as defined by the leading international ILS/IPS standards to support all LSA processes, with licenses controlling customer access to specific standards as required. Core international standards supported include:

- GEIA 0007 Standard
- US MIL-STD-1388 2B Standard
- UK DEF STAN 00-60 Standard
- ADO DEF (AUST) 5692 Standard
- An evolving capability to support the ASD S-Series ILS standards

ANALYZER

Analyzer™ uses recognised processes and analytical methods to develop, store and evaluate information about operational equipment and the support environment.

The Analyzer primary functions include Life Cycle Cost (LCC) Optimisation, Level of Repair Analysis (LORA), Spares Optimisation, and Availability Modelling. It is a key tool for managers, decision-makers, engineers, ILS teams and other staff involved in system design, system acquisition, proposal writing, support solution optimisation, in-service support management and through-life support.

Analyzer can determine the best repair policy for equipment and reduce the cost of owning spare parts. Cost estimation and prediction supports decisions based on Life Cycle Costs. Analyzer delivers value and provides analytical and decision support at all points of a product's life-cycle.

Analyzer is either a stand-alone decision modelling tool or integrated with OmegaPS LSAR to provide a tool that works with the many international standards of supportability data (e.g. MIL-STD-1388-2B, SAE GEIA-STD-0007, DEF- STAN-0060, DEF-AUST 5692, S3000L) additionally, Analyzer can be aligned with any of your bespoke standards through data exchange.

OmegaPS Analyzer has been a tool of choice for many customers and various applications for over 30 years. Over this time users have recognised the many benefits from using this flexible and intuitive modelling environment.

- a supportability engineering modelling and simulation tool that analyses support solutions for complex products, including multi-indenture logistics organisations
- a modern technology product that simplifies the analysis process and interfaces with current data transfer standards
- identifies preferred product sustainment strategies through options analysis
- applies sensitivity and risk analyses to improve awareness of variance and data quality impacts and of major cost drivers
- conducts through-life performance assessment of operational supportability solutions
- supports operational readiness at an affordable life cycle cost
- generates availability simulations of product support solutions

R4i SOFTWARE SERVICES

The Pennant Group has invested heavily in expanding their product reach and has recently added the industry-leading powerful R4i® Product Suite of S1000D publications software suite to its list of more than capable products. The combined years of experience in IPS standards and that of the ASD S1000D publications specification make Pennant a world leader in the delivery of IPS solutions and services to Air, Land, Sea, and Space organizations globally!

The R4i S1000D Suite has a 20-year track record as being affordable, fast, robust, quick to install and easy to use. The R4i interface continues to be upgraded and/or modernised as has already been completed three (3) times since the first release in January 2003. The R4i suite has an enviable reputation in market for user support, coverage of all versions of the S1000D specifications and most importantly for our customer relationships. The R4i brand has a well-known presence in the S1000D market across the globe and across industries, including Defence (Land, Sea and Air programs), Aerospace, Airlines, Space and to a smaller degree in Mining truck manufacturing.

While the R4i software consists of commercial off-the-shelf (COTS) products, our development team designs tools for our customers to solve specific business challenges. These R4i software applications are designed to be modular, easy to use and most importantly, robust.

- **R4i CSDB Server®** - The R4i Common Source DataBase enables you to create, manage and publish content, both electronically and in hard copy. The R4i CSDB consists of powerful tools that work together to deliver content to multiple devices and formats. These are: R4i Data Module Manager, R4i Common Specification Manager, R4i Fault Code Manager and the R4i Viewer®.

- **R4i Binder Professional** - R4i Binder is a flexible 'drag and drop' system that allows you to build complete PDF Books that include cover pages, hyperlinked Table of Contents (TOC) and a hyperlinked Index. R4i Binder accesses ASD S1000D, DITA and other structured content held in the R4i CSDB Server's database and processes the content using XSL-FO stylesheets. R4i Binder is an optional module for the R4i CSDB Server.

- **R4i Viewer®** - Utilise this royalty-free online and offline IETM viewer, and you'll benefit from advanced publication generation capabilities. The R4i CSDB outputs content for this smart, installable IETM Viewer for the Microsoft Windows platform. R4i Viewer supports the dynamic presentation of SGML, XML and PDF formats, as well as audio, video and other written and graphical content.

- **R4i ReViewer** - This licensed feature enables an advanced tool set for those utilising the Free R4i Viewer® as an IETM proofing, audit and review tool. Advanced features include the ability to add sticky notes to Data Modules and save them as Comment Modules, Automated Link Checker, Reports and final Encryption.

R4i CDMS (Content Distribution & Management Server) - R4i CDMS is an IETP Distribution Ecosystem that provides information publishers with control of the distribution lifecycle of their online and offline content. The CDMS is designed specifically to make deployment and maintenance of IETP Viewers and IETP content easy for Publication Managers without needing assistance for the IT department.

R4i Writer for S1000D Authoring - R4i Writer is a powerful XML Authoring tool which is optimized for the ASD S1000D data formats. Now authors can easily create high quality operational and maintainer information for PDF, HTML and IETP delivery. R4i Writer installs "Ready to Write" with schema's and stylesheets for S1000D versions 2.0 to latest.

R4i IPD Manager (Illustrated Parts Data) - R4i Illustrated Parts Data Manager automates the process of parts data creation, speeding time to market and eliminating human error from the parts data production cycle. Designed to connect to disparate information systems, Microsoft Excel spread sheets and SQL Databases, IPD Manager authors simply map the data fields to their required export data sets.

R4i LTS (LSA To S1000D) - R4I LTS (LSA to S1000D) is a powerful productivity tool that takes engineering content contained within a Logistics Services Analysis (LSA) database and utilizes it to dynamically generate compliant technical data to the ASD S1000D specification. R4i LTS is an optional licensed module that integrates with the R4i Common Source Database (CSDB) Server.
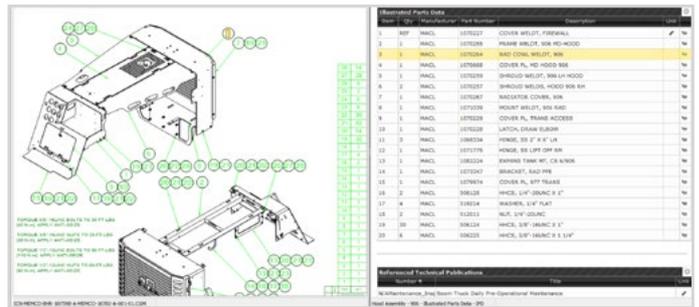
R4i AIR – S1000D TOOLS IN THE CLOUD

R4i AIR S1000D Hosted Software provides authoring teams with a turnkey, ready to write S1000D Product Suite without the upfront cost of purchasing hardware and software. Start your S1000D project today by subscribing to a selection of Hosted S1000D systems. Each system includes Authoring, Management, and Print tools that connect to R4i's in-Cloud Common Source Databases.

INTRODUCING THE FUTURE OF INTEGRATED PRODUCT SUPPORT > IPS/GENS

The Pennant IPS Division has developed ground-breaking software to take your product support to a whole new level. Our next generation of LSA technology GenS, when combined with the R4i Suite will transform your Integrated Product Support requirements into a truly integrated secure digital capability. Designed to power iterative supportability and logistics analysis, stakeholder collaboration, data-driven decisions, and organised management for unbeatable product support. GenS simplifies complex product support integration with an easy solution for complex problems.

GenS is built on the latest international standards and specifications and backed by a dedicated multi-generational team of software developers and supportability engineers who are eager to deliver an incredible end user experience. This next-generation of integrated product support software combines over 60 years of design and development experience from the Pennant development teams around the globe, utilising latest technology and innovative new capabilities.

STUDIO SERVICES

Pennant Studio Services is the department of highly skilled artists, illustrators, developers, technical authors, translators, and varied industry experts.
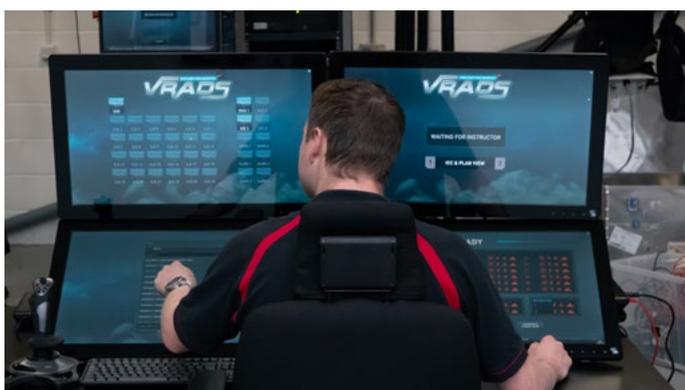
STUDIO SERVICES – CAPABILITIES

The work and capabilities of the Studio Services department covers:

- **2D & 3D Design** - including animation, realistic reconstruction, graphic design concepts and creation for both digital and print outcomes

- **VR Media Development** - emulation and simulation, walk-throughs and realistic high and low poly level modelling

- **Film and Media Production** - training, promotional and driver route training videos

- **E-Learning and CBT** - Instructor led or self-paced interactive SCORM compliant courseware, incident / reconstructive training, electronic classrooms and flash conversion

- **Illustration** - Technical & CAD illustration and art / creative illustration

- **Authoring, Copy-writing and Translation**

- **Development of applications and products** for HM Revenue & Customs (HMRC)

These capabilities are on display in numerous Pennant products, as well as an impressive list of external businesses and customers from many sectors.

TECHNICAL PUBLICATIONS

A fundamental part of Studio Services is the **Technical Publications** capability. This can be anything from a printed owner's handbook to an interactive electronic technical manual (IETM), including intelligent 3D graphics compliant with S1000D, accessible over the internet on a range of mobile devices.

The global Pennant team of authors, illustrators and consultants have the ability to manage, develop, and deliver complex source data into a variety of technical manuals such as Operation and Maintenance Manuals, Parts Catalogues and training courseware utilising the robust Pennant IPS software.

We are proud of our hard-won reputation across a wide range of global industry, government and commercial sectors, including Defence, Aerospace, Rail, Automotive, IT and Communications, Power Generation, Utilities, Nuclear, Petro Chem & Gas, and many more.

With more than 60 years' experience and innovative technical development in the field, we are confident that our offer is comprehensive, professional and competitive.
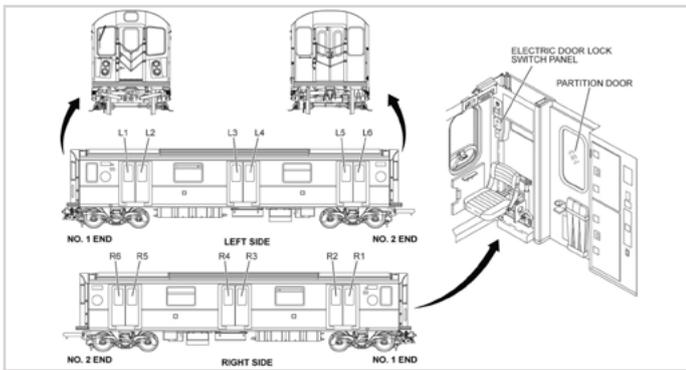
WE HAVE WORKED WITH:

RAIL & TRACK ACCESS SERVICES (TAS)

Pennant has over 50 years' experience working with rail industry primes and their supply chain, adding value through experience, capability and versatility, offering limitless potential for information transfer. The addition of Track Access Services to the group has further strengthened our capabilities and offering to the rail sector.

Pennant has been involved in numerous rail projects, showcasing extensive experience and expertise. Successful manuals and training contracts across the world have included the design, production and development of Operator and Maintenance Manuals, Work Instructions, Illustrated Parts Catalogues, Training Courseware, and the delivery of both classroom and practical training.

In 2019 Pennant were pleased to announce the acquisition of Track Access Services (TAS). TAS was established in 2002 and began by producing cab-ride videos to show the driver's eye view of the railway throughout the UK. This quickly became recognised as a valuable tool for Network Rail and the Train and Freight Operating companies, improving driver route knowledge and safety on the railways.

TAS developed the first PC program for delivery of Driver Route Leaning material with their Route Player application, which synchronises driver's eye video to its location on an interactive map. The online version of the application, TrackAccessPortal.com, delivers the material to any platform. Other capabilities include:

▼ Realistic Simulation Modelling used to visualise enhancements and renewals of railway infrastructure

▼ Provide operational briefing to drivers prior to commissioning

▼ Possession planning and signal sighting work to be carried out from desktop environments

RAILWAY SURVEY   SIGNAL SIGHTING   RAILWAY SIMULATION   DRIVER TRAINING