

OEM Technology Solutions provides the control hardware and software for the air conditioning systems as part of Siemens Transport Systems' (TS) Group Desiro UK train production.



A design study of the British Desiro car

Air International UK (AI-UK), a major customer of OEM Technology Solutions, has been selected to supply air conditioners for the Desiro UK trains. AI-UK manufacture air conditioners specifically designed for the tough environmental conditions associated with rail cars. AI-UK incorporates in its air conditioners a sophisticated air conditioning controller designed and developed by OEM Technology Solutions. The controller (AIT2004) is based on a rugged single board

computer which provides state of the art control of the air conditioner to keep the rail car environment at its most comfortable.

The air conditioners are an integral part of the new Desiro UK trains built by TS. TS will deliver 1200 units of the modular regional trainset concept Desiro to Great Britain. Worth a total of approximately 2.5 billion euro (option included), it is the biggest order in TS history so far.

The British railway operator Stagecoach Group, the leasing company Angel Trains and the Siemens Transportation Systems (TS) Group have publicly introduced the first Desiro UK train at the Siemens test centre for rail-based transportation systems in Wegberg-Wildenrath. The vehicles are to run on the network of South West Trains, a Stagecoach Group affiliate, southwest of London.

The Desiro train rolled out is the first of 132 trains of the Class 450 which South West Trains will operate in mass transit in future. The Class 450 series will replace the over 30 year-old Mark I, the so-called 'slam-door' fleet. The first Desiro UK will be put to service by the end of this year. It will bring significant benefits to the travelling public including: air conditioning, audio and visual passenger information displays and dedicated facilities for disabled passengers.



OEM Technology Solutions apply technology, innovative engineering and design services to develop products & systems to deliver a competitive edge to our customers.

OUR SERVICES

- Research
- Design
- Development
- Manufacture
- Validation
- Commissioning
- Support

OUR SKILLS

- Complex Solutions
- Systems Engineering
- Electronics
- Software
- Mechanical Design
- Production
- Integration
- Testing

This train was shipped to Germany to replicate the exact conditions of the UK network on Siemens' test track. Every detail was considered even down to recreating British icy weather conditions by using blocks of dry ice to freeze the conductor rail down to minus 14 degrees centigrade. Pieces of fibreglass resin were placed on the tracks to replicate icy conditions and the perennial problems caused by leaves on the line. The trains undergo extensive tests at Wildenrath and complete much of the required Safety Case testing before going to the UK.

Kevin Tutton, managing director of Siemens Transportation Systems, said: "When we designed Desiro UK we looked at providing the train operator with a total solution. This package includes not only the vehicle but also a long-term commitment to deliver a world class and reliable service from day one. Today marks a significant milestone on the road to delivering a better service to South West Trains' commuters."

South West Trains runs 1,700 services a day into and out of London Waterloo through 11 counties in the south and south west of England. The company employs 5,000 staff with passengers making 142 million journeys a year – the highest number of any train company.

Angel Trains Group, is a leading lessor of rolling stock in both the UK and continental Europe, with investments of £2,4 billion in new trains, over £150 million in fleet reliability and refurbishment in the UK and 220 million euro in continental European rail markets.

Angel Trains is a wholly owned subsidiary of the Royal Bank of Scotland Group, one of Europe's leading financial services groups, founded in 1727. The Royal Bank of Scotland Group is the UK's sixth largest company, the second largest bank in the UK and Europe, and it ranks fifth in the world, by market capitalisation as at 28 February 2002.



The AIT2004 controller has direct interfaces to digital and analog I/O and provides a HMI via an associated LCD and keypad. The AIT2004 controller is easily programmed using the embedded IEC61131-3 programming language. The controller has been tested to comply with the EN50155 standard to ensure that it meets the high reliability requirements needed in such an environment.



AIT2004 Controller Specifications

Enclosure size

140mm W x 177mm H x 40mm D

Operating temperature

-40 Degrees C to +70 Degrees C

Power Supply Range

15-33 VDC Nominal 24VDC @ 140mA

Digital inputs (D/I)

16 off. With transorb and inductor protection. Active low with 2.5-volt threshold. Input range tolerance -48 to +48 VDC

Analog inputs (A/I)

8 off. With transorb and inductor protection. 12-bit accuracy. Accept either a 0-5 VDC A/I or D/I with up to 3 programmable thresholds per input.

Digital outputs (D/O)

16 off. With transorb and inductor protection. Open collector NPN transistor driver outputs each capable of driving a 500 mA inductive load from a max. 50 VDC source.

Serial Port #0

RS-232 Port full duplex with hardwire

Serial Port #1

Configurable as an RS-232 or RS-485 port

PCB coating

Component circuit boards covered with a tropic proof conformal. Typically 50 Deg. C, 95% RH non-condensing.

Protective devices

Sand filled fuse installed. Rated at 3.15A

Terminal connections

All PLC connections are screw terminal modules with horizontal plug and socket connections

Memory configuration

128 Kb static RAM with 950mAH backup battery. 256 Kb FLASH EPROM

Expansion Capability

Standard via the PLCBus. The PLCBus allows connection from the AIT2004 Controller to standard AIT Expansion Modules, all of which have necessary transorb and inductor protection, including:

AIT2011 – 16 D/I, 16 D/O, 4 A/I

AIT2012 – 16 D/I, 16 D/O

AIT2013 – 16 D/I, 16 D/O, 4 A/I

AIT2014 – 16 D/I, 22 D/O,

1 x Isolated RS-485 port

Software

Programmable via the IEC61131-3 compliant ISaGRAF soft logic development package.

Compliance

BS EN50155: 1996.



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