



Synapse System Full Specifications



System Specification

Transceiver Technical Specification

RF Specification (Receive)

Operating Frequency	434.010MHz
Bandwidth	64KHz
Sensitivity	-108dbm
Antenna	165mm 1/4wavelength whip (Permanently attached)

RF Specification (transmit)

Operating Frequency	434.010MHz
Max Output Power	10mW
Modulation	FSK
Bandwidth	64KHz
Max transmit duration	46mS
Antenna	165mm 1/4wavelength whip (Permanently attached)
Range – Open Ground	800m approx
Range inside building	60m approx
	NOTE range is influenced by many things so the installer should check for correct operation of the system after installing.



Power source	2 x AA battery
Average Power Use	100uA approximate
Peak Consumption	45mA
Weight w/o batteries	145g approx
Weight with batteries	200g approx
Height	113mm
Height (with antenna)	278mm
Width	73mm
Depth	23mm
Installation	Wall mounted
RF Protocol	Half Duplex
Coding	Proprietary
Bit Rate	4800 Bps
Display	LCD 3 line STN

Transponder Specification

RF Specification (Receive)

Operating Frequency	434.010MHz
Bandwidth	64KHz
Sensitivity	-108dbm
Antenna	165mm 1/4wavelength whip (Permanently attached)

RF Specification (transmit)

Operating Frequency	434.010MHz
Max Output Power	10mW
Modulation	FSK
Bandwidth	64KHz
Max transmit duration	46mS
Antenna	165mm 1/4wavelength whip (Permanently attached)
Range – Open Ground	800m approx
Range inside building	60m approx NOTE range is influenced by many things so the installer should check for correct operation of the system after installing.



Power source	3V DC regulated mains adaptor
Battery Backup	2 x AA battery
Average Power Use	39mA approximate
Peak Consumption	45mA
Weight w/o batteries	145g approx
Weight with batteries	200g approx
Height	113mm
Height (with antenna)	278mm
Width	73mm
Depth	23mm
Installation	Wall mounted
RF Protocol	Half Duplex
Coding	Proprietary
Bit Rate	4800 Bps
Display	LCD 3 line STN

Receiver Specification

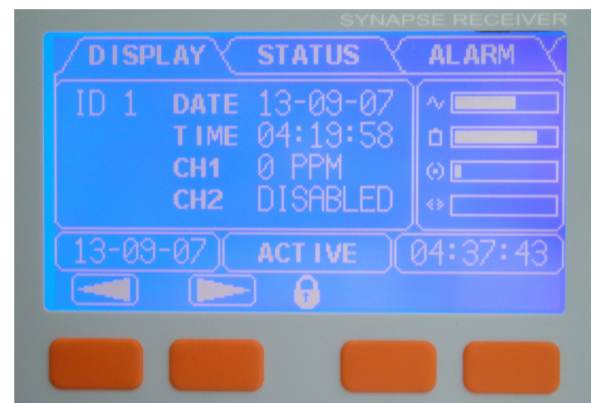
RF Specification (Receive)

Operating Frequency	434.010MHz
Bandwidth	64KHz
Sensitivity	-110dbm
Antenna	165mm 1/4wavelength whip (Permanently attached)

RF Specification (transmit)

Operating Frequency	434.010MHz
Max Output Power	10mW
Modulation	FSK
Bandwidth	64KHz
Max transmit duration	46mS
Antenna	165mm 1/4wavelength whip (Permanently attached)
Range – Open Ground	800m approx
Range inside building	70m approx NOTE range is influenced by many things so the installer should check for correct operation of the system after installing.

Power source	12V DC Adaptor 500mA Plug Top
Battery Backup	8.4V 3.7Ah NimH
Internal Fuse	1A Anti Surge
Average Power Use	300mA approximate
Peak Consumption	800mA
Weight w/o batteries	1.15Kg approx
Weight with batteries	1.9Kg approx
Height	225mm
Height (with antenna)	395mm
Width	325mm
Depth	50mm
Installation	Wall mounted
RF Protocol	Half Duplex



Coding	Proprietary
Bit Rate	4800 Bps
Alarm Output	Volts free contact SPCO
Display	Graphic Backlit LCD 110mm x 60mm viewable area
Data output Control interface	Ethernet (CAT5) using Synapse Software
Network Protocols	TCP/IP UDP ICMP ARP DHCP
Data Storage	196512 data points using Internal (Up to approx 770 Million with memory card
Memory card	SD/MMC 4Mb to 4Gb

Secure Wireless Protocol - Zen



All data transfers are carried out using a 7 level encrypted duplex protocol that was designed Specifically for the synapse system.

This protocol includes many advanced features that are not found in other systems.

The registered gateway and Zen protocol were designed to provide all the high level features That set synapse apart from other wireless systems.

The sophisticated Zen protocol allows for automated installation and self healing in the event that environmental conditions change.

Each synapse unit also recalibrates the RF system prior to each transmission or reception To ensure that optimum performance is maintained.

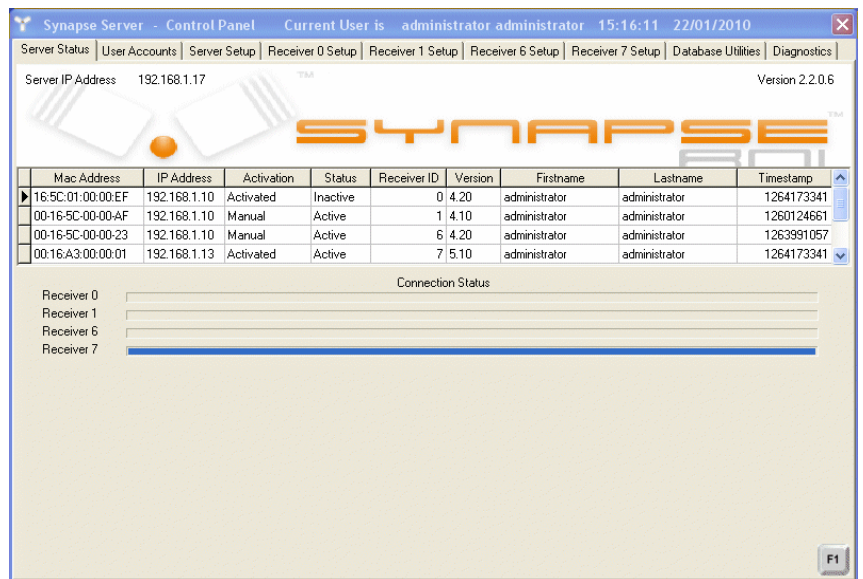
Synapse has full error detection and retry capability to enable it to have any lost data packets Resent which guarantees that the system can reliably capture 100% of the data.

Synapse Software - Server

The Server software is typically installed on a single PC on the user network and it is used to link the Synapse hardware to an SQL database where all captured data will be stored.

The server application runs as a Background task on the PC and the interface shown here is used to allow user configuration of the system.

The Synapse server is fully 21 CFR Part 11 compatible including password protection for The configuration interface. The server can also generate Alarm event emails and voice Messages to alert users to Any out of tolerance events.



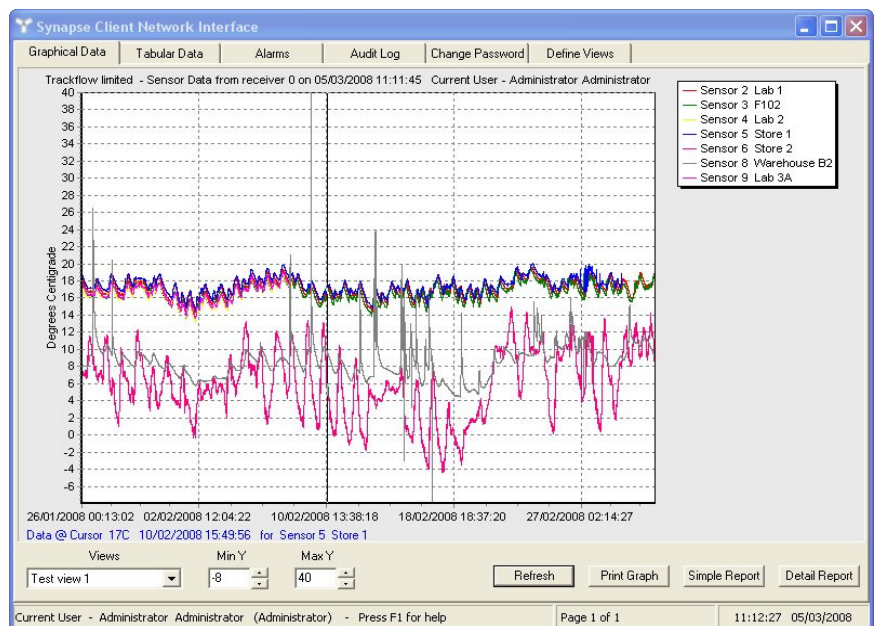
Synapse Software - Client

The Client software can be Installed on as many PC's Across the users network As the available licences Will allow. It provides an Easy means to view the Captured data and produce Professional looking reports With minimal effort.

The client is a stand alone Application and does not Require that the Synapse Server be running in order To operate.

The system can be used With any SQL database That has support for the ODBC model.

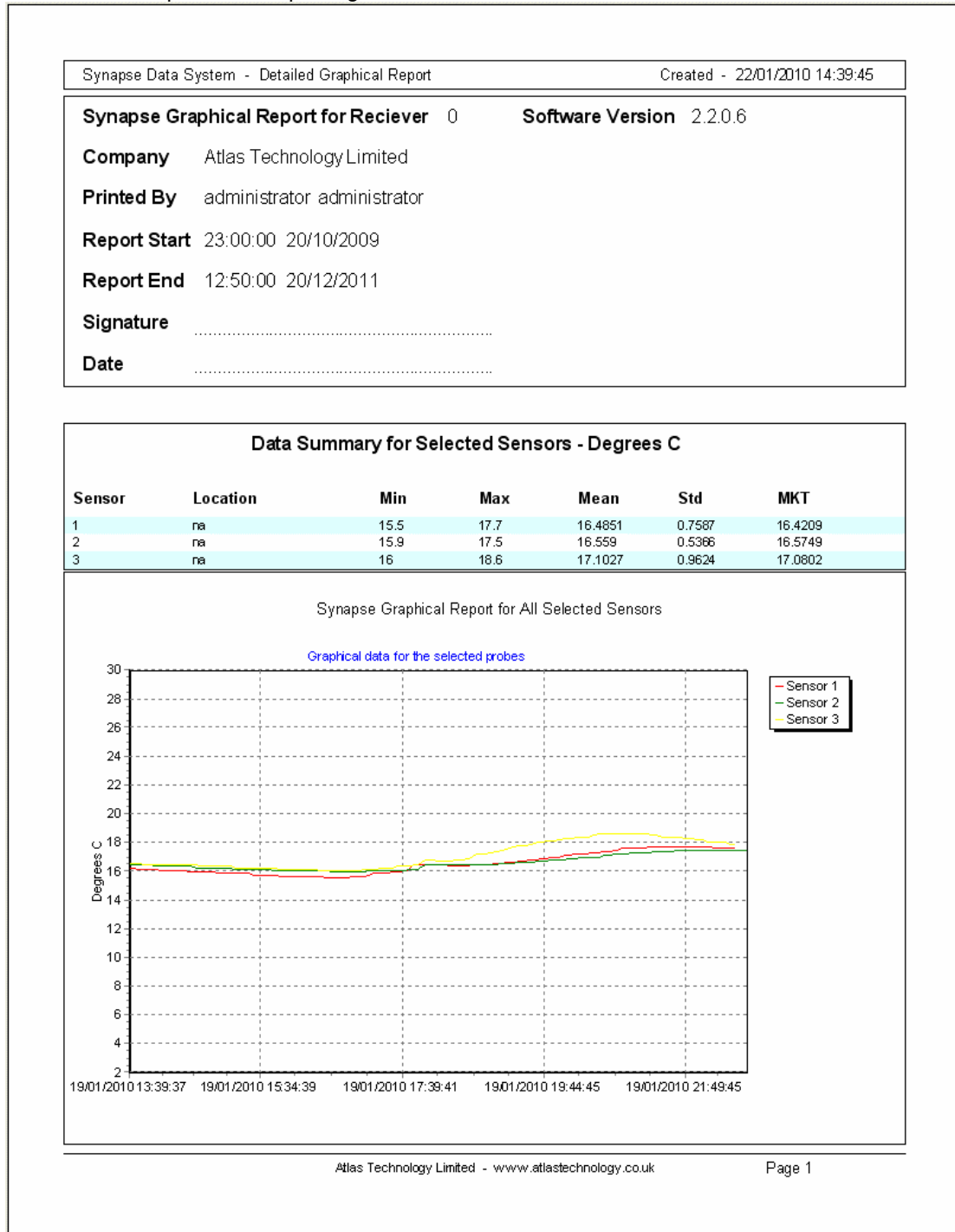
Driver which includes all Current main stream SQL Databases. The user has The option to either use The database supplied as Part of the synapse suite Or use an existing one.



Synapse Reports

The Client software can provide various reports with a single mouse click. Simply select the data view required and click the required report type button and a report is automatically created. The resulting reports can either be sent directly to a printer or can be sent to a file for archiving or storing for later viewing. This also provides an easy solution creating 'sealed' files for submission to the required governing bodies when required to fully satisfy the 21 CFR directive.

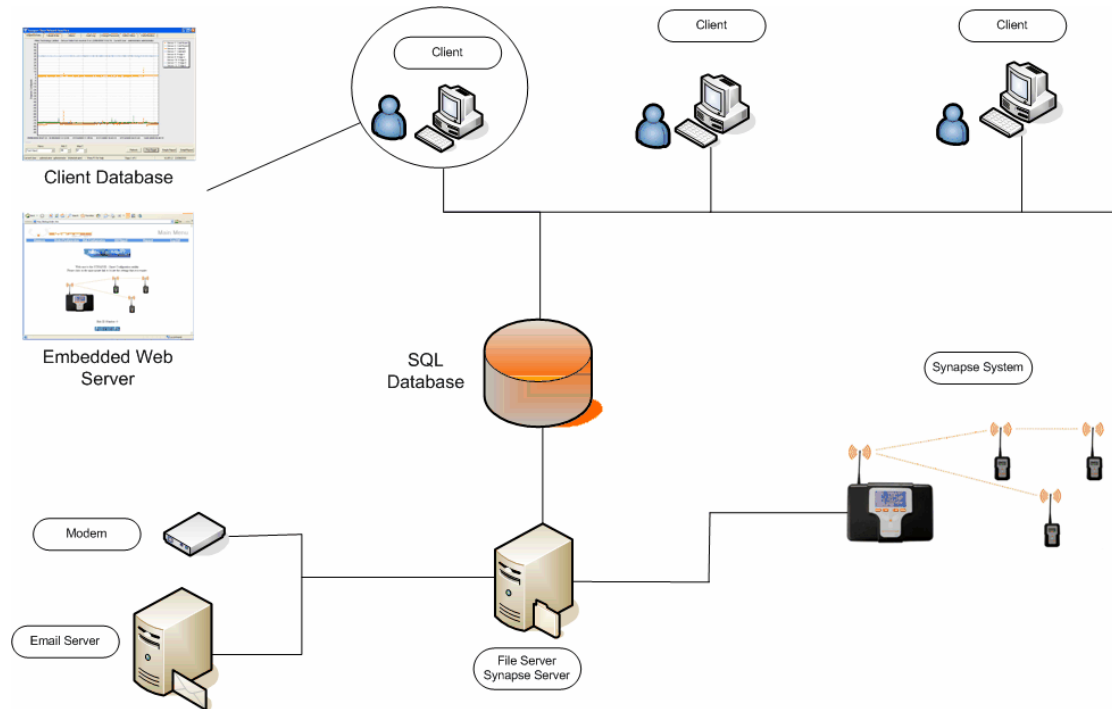
This is an example of the reporting format



Synapse System Configuration

The Synapse system has been designed as a set of modules to provide the end user with The maximum installation flexibility. Each part of the system can be installed anywhere on the Network provided network communications are possible between the various areas.

The following diagram shows a typical Synapse installation across a LAN or WAN.



The Synapse system also supports multiple servers and databases for users who may want To share system resources but keep their data separate and accessible only to their own Client operators.

21 CFR Part 11 Compliance

The synapse system is fully 21CFR -11 compatible and in addition Atlas Technology can offer A full validation and consultancy service to ensure that supply, installation and operation of The system is carried out in a manner that achieves full compliance as dictated by the Regulatory bodies. The synapse validation kit and operating procedures can be used to Form the basis of a data capture quality system that can withstand any audit. All the system features required to meet this target such as secure access, electronic Signatures and audit logs have been designed as an integral part of the system.

Alarm / Alert Conditions and notification

The system can be configured to provide user alerts and alarms to out of tolerance events or Conditions using either email and / or voice messaging. Each sensor has two sets of high and Low set points along with a user configurable alarm delay. This allow the system to provide Not only out of tolerance alarms but prior notification of pending events before they occur Which can be invaluable when high cost or hard to replace products are being monitored.

The following table indicates the various alarms that can be generated

Alarm	Description	Source
Low Battery	The battery in unit n is less than 2.6V	Transceiver n
CH1 High Alert	Unit n Channel 1 High Alert level has been exceeded	Transceiver n
CH1 Low Alert	Unit n Channel 1 Low Alert level has been exceeded	Transceiver n
CH1 High Alarm	Unit n Channel 1 High Alarm level has been exceeded continuously for longer that the set alarm delay	Transceiver n
CH1 Low Alarm	Unit n Channel 1 Low Alarm level has been exceeded continuously for longer that the set alarm delay	Transceiver n
CH2 High Alert	Unit n Channel 2 High Alert level has been exceeded	Transceiver n
CH2 Low Alert	Unit n Channel 2 Low Alert level has been exceeded	Transceiver n
CH2 High Alarm	Unit n Channel 2 High Alarm level has been exceeded continuously for longer that the set alarm delay	Transceiver n
CH2 Low Alarm	Unit n Channel 2 Low Alarm level has been exceeded continuously for longer that the set alarm delay	Transceiver n
Lost Contact	Unit n has failed to communicate with the receiver for an excessive period	System receiver

When an alarm is generated and email and / or voice messaging has been enabled then the Received message includes all the information required by the user to fully access the alarm. This includes sensor id, time, date, receiver id, alarm type, current data value.

Sensor Specification – Probe Types

Standard Temperature and Humidity Sensor (Internal) – Probe Type 0

Temperature

Type	Digital
Range	0 – +40C
Resolution	Measured 0.04C Indicated 0.1C
Repeatability	+/- 0.1C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	5 minutes

Humidity

Type	Digital
Range	0 – 100%
Resolution	measured 0.03% Indicated 0.1%
Repeatability	+/- 0.1%
Accuracy	+/- 2%
Accuracy Uncertainty	< 10% > 90% = +/- 4% max
Linearity	< 1%
Response time 1/e(63%)	4 seconds (slowly moving air)
Hysteresis	+/- 1%
Long term stability	< 1%/yr

Standard Temperature and Humidity Sensor (External Only) – Probe Type 0

Temperature

Type	Digital
Range	-40 – +123.8C
Resolution	Measured 0.04C Indicated 0.1C
Repeatability	+/- 0.1C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	30 seconds

Humidity

Type	Digital
Range	0 – 100%
Resolution	measured 0.03% Indicated 0.1%
Repeatability	+/- 0.1%
Accuracy	+/- 2%
Accuracy Uncertainty	< 10% > 90% = +/- 4% max
Linearity	< 1%
Response time 1/e(63%)	4 seconds (slowly moving air)
Hysteresis	+/- 1%
Long term stability	< 1%/yr

Extended Temperature Sensor (External only) – Probe Type 1 Temperature

Type	PT100
Range	-200 – +200C
Resolution	Measured 0.05C Indicated 0.1C
Repeatability	+/- 0.1C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds (depending on structure)

Ethylene Sensor (External only) – Probe Type 3

Type	Proprietary
Range	0 – 25ppm
Resolution	0.1ppm
Repeatability	0.1ppm
Accuracy	+/- 0.2ppm
Response time 1/e(63%)	3 minutes

Pressure Sensor – Differential Pascals (Internal Only) – Probe Type 4

Type	Proprietary
Range	-250 – +250Pa
Resolution	0.1Pa
Repeatability	0.1Pa
Accuracy	+/- 0.5Pa
Response time 1/e(63%)	0.1 Second
Non Linearity	+/- 0.25% FSS

CO2 Sensor (External only) – Probe Type 5

Type	Proprietary
Range	0 – 20%
Resolution	0.1%
Repeatability	0.01%
Accuracy	< +/-0.02% + 2% of reading (@ normal atmosphere)
Response time 1/e(63%)	30 seconds

0-1V 0.0-100% (External only) – Probe Type 6

Type	Proprietary
Range	0V – 1V Scaled to 0-100.0%
Resolution	0.1%
Repeatability	0.1%
Accuracy	+/- 0.4%
Response time 1/e(63%)	100mS

Light Level Sensor (Internal) – Probe Type 7

Type	Proprietary
Range	0 – 1000 lux
Resolution	1 lux
Repeatability	2 lux
Accuracy	+/- 1%
Response time 1/e(63%)	500 mS

Pressure Sensor – Differential millibars (Internal Only) – Probe Type 8

Type	Proprietary
Range	-12.5 - + 12.5mb
Resolution	0.1mb
Repeatability	0.1mb
Accuracy	+/- 0.3mb
Response time 1/e(63%)	0.1 Second
Non Linearity	+/- 0.25% FSS

**Standard Temperature only Sensor (External Only) – Probe Type 9
Temperature**

Type	Digital
Range	-40 – +80C
Resolution	Measured 0.1C Indicated 0.1C
Repeatability	+/- 0.2C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds

**Dual Temperature and Door switch Sensor (External Only) – Probe Type 10
Air - Temperature**

Type	Digital
Range	-40 – +80C
Resolution	Measured 0.1C Indicated 0.1C
Repeatability	+/- 0.2C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds

Load - Temperature

Type	Digital
Range	-40 – +80C
Resolution	Measured 0.1C Indicated 0.1C
Repeatability	+/- 0.2C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds

Door Sensor

Type	Magnetic Proximity
Contacts	Normally Closed

Note: Data is not logged for the door switch

Dual Temperature and Door switch Sensor (External Only) – Probe Type 11

Air - Temperature

Type	Digital
Range	-40 – +80C
Resolution	Measured 0.1C Indicated 0.1C
Repeatability	+/- 0.2C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds

Load - Temperature

Type	Digital
Range	-40 – +80C
Resolution	Measured 0.1C Indicated 0.1C
Repeatability	+/- 0.2C
Accuracy	+/- 0.5C @ 25.0C
Response time 1/e(63%)	20 seconds

IT Systems - Specification

PC minimum specification

Processor	-	Pentium class or equivalent 1.5GHz
Memory	-	510Mb
Hard Disk Space (Application)	-	60Mb
Hard Disk Space (Data)	-	1Mb per 5000 data points
Display	-	VGA

Windows Versions supported

Windows XP and XP professional
Windows 2003 Server
Windows 2003 Virtual Server (VMware)
Windows Vista (all variants)
Windows 7

Communications Protocols

SQL to applications - TCP/IP default port 3306 (user configurable)

Hardware to server application – UDP ports 11223, 11224, 11225 Half duplex

Bandwidth – 0.07% of 10Mbs network

Applications

The Synapse Server runs as a Windows service
The SQL database runs as a Windows service
The Synapse Client runs as a standard user application

NOTE

The system RF protocol does Not use Wifi so there is not security risk as it is not possible to access the network from the RF link

Installation Service and Planned Maintenance

Atlas Technology can provide a comprehensive installation service which can include full on site system validation and IQ / OQ along with user training and operational procedure development. This is backed up by a full documentation pack including Supplier Factory Acceptance Test and calibration certificates.

We also provide free of charge a fully documented installation plan and detailed project handling plan for review by the customer prior to installation to ensure that all the end user requirements will be met.

In addition we can also offer a full range of service plans to cover all your planned maintenance needs to follow on from the end of the warranty period.

ATLAS TECHNOLOGY PREVENTIVE MAINTENANCE CONTRACTS

THESE CONTRACTS CAN BE PURCHASED FROM ATLAS AT ANY TIME. PURCHASE A CONTRACT BEFORE THE END OF THE WARRANTY PERIOD TO BENEFIT FROM CONTINUOUS COVER.

Bronze Contract

Includes all travel and labour for one routine service and a standard single-point calibration visit per annum (Parts not included).

Additional travel, labour and parts charged separately (discounted rates for labour and spares apply as indicated below). (**Consumables are not included**).

Silver Contract

Includes all travel and labour and spare parts for one routine service and a standard single-point calibration visit per annum.

Additional spare parts and labour are charged extra at discounted rate (No callout charge). (**Consumables are not included**).

Gold Contract

Includes all travel, labour and spare parts for one routine service and a standard single-point calibration visit per annum plus unlimited emergency call-outs. (**Consumables are not included**).

Additional Travel Costs (NON UK mainland)

For non UK mainland customers any travel and expenses will be charged extra at cost.

Additional Routine Service Visits

Additional service visits are available for an additional charge.

Rates for Emergency Call-Outs	<i>Bronze Contract Holders</i>	<i>Non-Contract Customers</i>
Call-out charge	£105	£135
Labour	£65/hour	£80/hour

Calibration

Single Point calibration is included in the standard service contract. Additional multipoint calibration is available on request at extra cost.

Guarantee

All spare parts fitted during services are guaranteed free from defects for a period of twelve months. Should any fault recur during this period as a result of faulty materials or workmanship we will repair it free of charge. This does not include consumables.