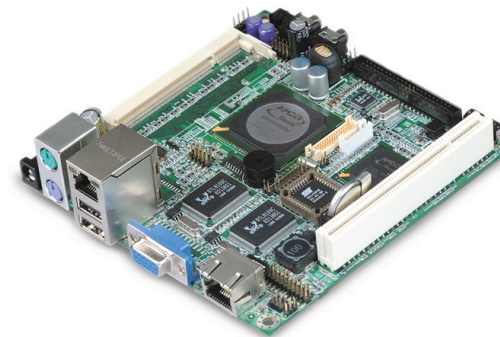# Computing Platforms for the Transport Sector
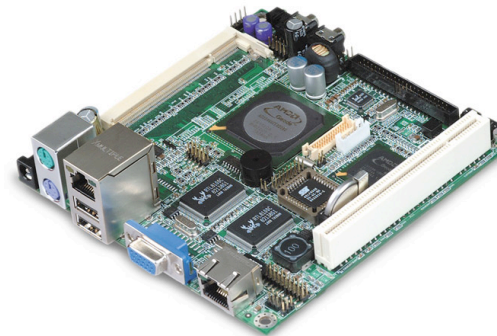
Presented by Richard Cobden

Engineering Manager at Amplicon
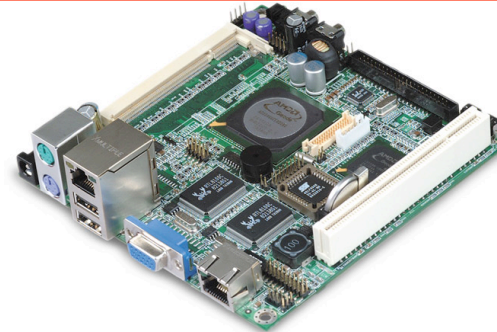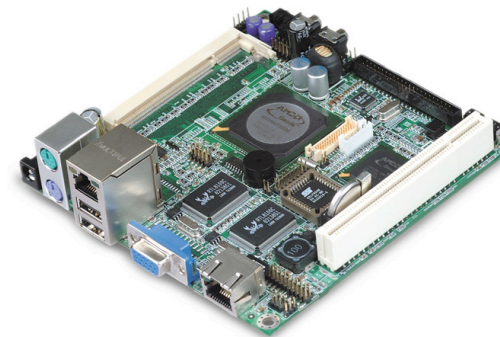
Amplicon

Computers used within Transportation

Computers used within Transportation

Computers used within Transportation

Computers used within Transportation

Computers used within Transportation

Windows XP – Dead or Alive?

Identical Software

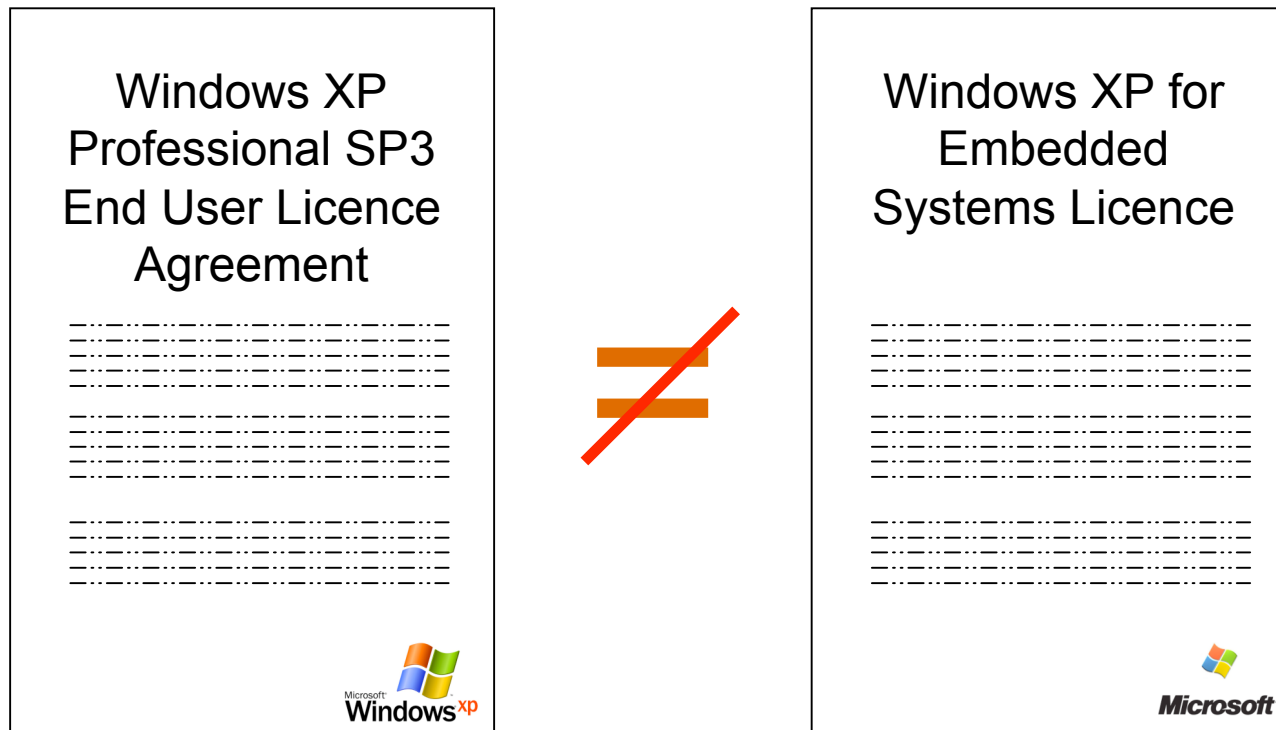End Date 31/1/2009

Windows XP
Professional SP3

=

End Date 31/12/2016

Windows XP for
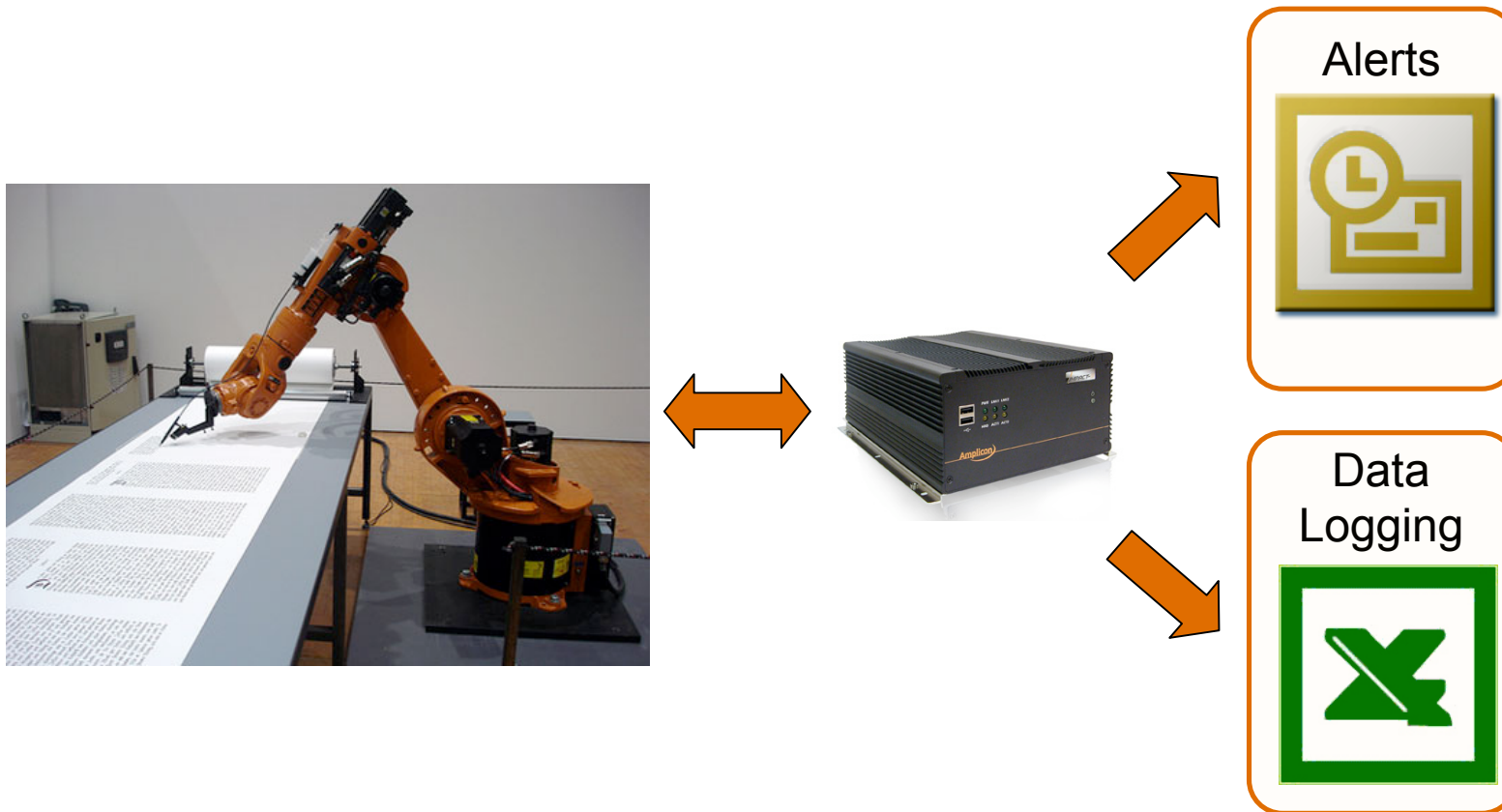Embedded Systems
(FES)

What's Different - Licence Restrictions

Windows XP Professional SP3 End User Licence Agreement

≠

Windows XP for Embedded Systems Licence

Understanding the FES Licence….

"**Software that provides consumer or business tasks or processes may not run on the device**. This includes email, word processing, spreadsheet, database, scheduling and personal finance software."

"However, use of such software is **permissible if its sole function is to support the main application** software which is not performing a consumer or business task or process."

Example Process Using Office Applications

Alerts

Data Logging

No Microsoft Media is Provided

We are unable to provide copies of the Windows installation disk due to licence terms.

We can provide a system recovery disks for most systems.

Solid State Drives (SSD)
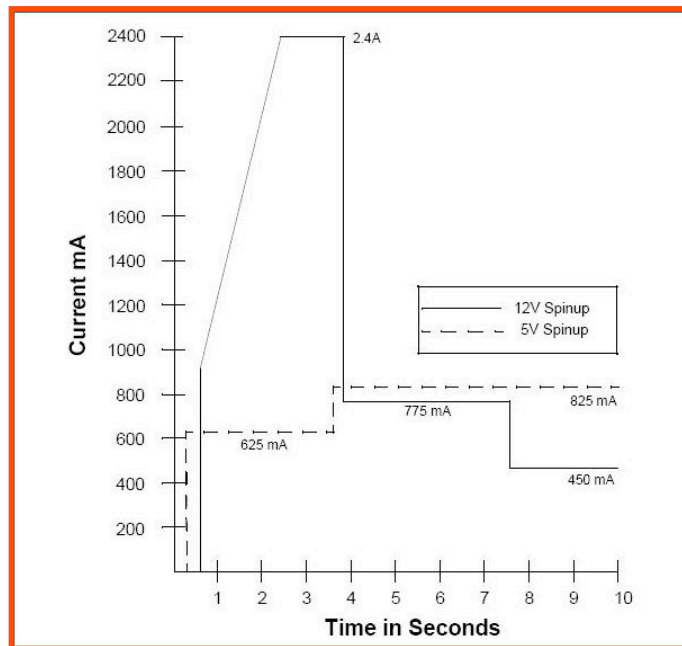
Benefits of SSD

- Excellent environmental specifications

- Ideal for low powered applications

- Faster system boot

Environmental Benefits

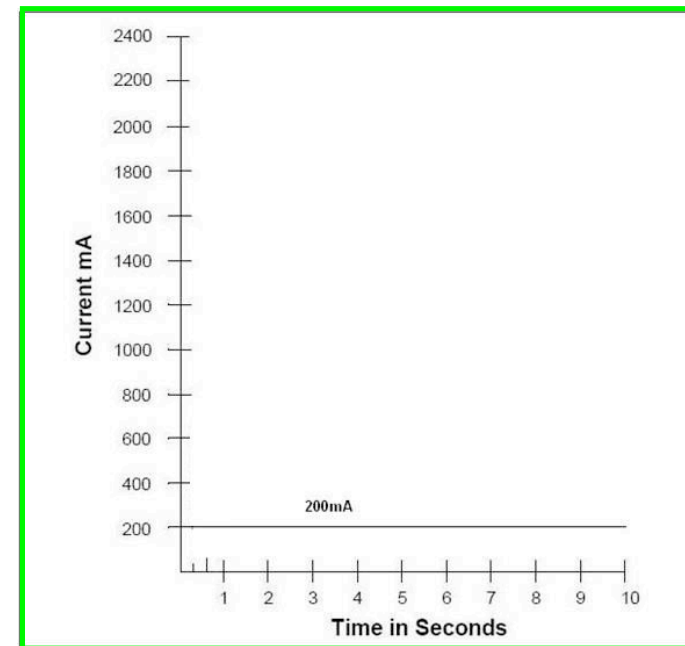| Operational Temperature	-40 to 85˚C	0 to 60˚C
Shock Resistance	1500G, 0.8ms (MIL-STD-810F)	65G, 2.0ms
Vibration Resistance	16.3G (MIL-STD-810F)	0.75G
Altitude	80,000 feet	10,000 feet
Sound Level	Silent	32dBA

Electrical Benefits

3.5" Hard Drive

2.5" SSD

Limitations of SSD

- Limited write / erase cycles

- Vague specifications from some manufacturers

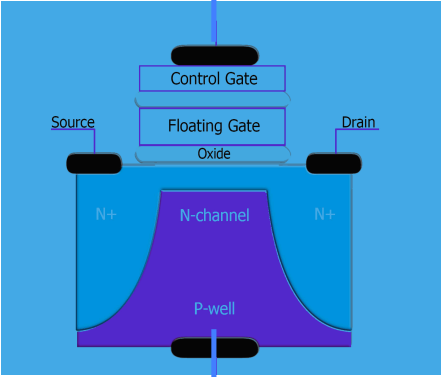- Sequential write speeds slower compared to hard drive

NAND Cell Types

Multi-Level Cell (**MLC**)

Multiple states
per cell

Read 148MB/s
Write 92MB/s

5,000~10,000 Writes

Single Level Cell (**SLC**)

Cell has 1/0
operation

Read 163MB/s
Write 142MB/s

100,000 Writes

Control Gate

Source   Floating Gate   Drain

Oxide

N+   N-channel   N+

P-well

How long will my SSD last?

Writing 1,687.5 GB per day (SLC)……………

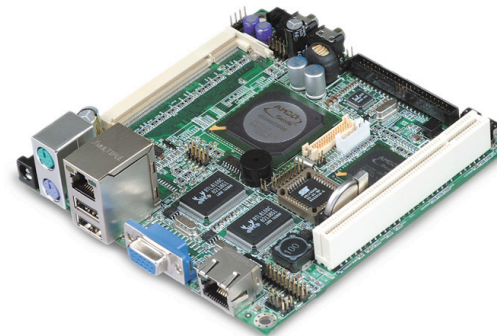30 GB SSD will have a service life of 4.9 years

60 GB SSD will have a service life of 9.7 years

120 GB SSD will have a service life of 19.5 years

Equivalent MLC device will last for 1/10 of these times……..
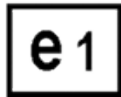
30 GB SSD will have a service life of 0.49 years

Computers used within Transportation

Transportation Requirements

- Vehicle

- Rail

- Maritime

Vehicle

"e" Mark is used by component manufacturers to demonstrate compliance to Automotive EMC Directive within the EU.

"E" Mark is very similar to "e" Mark, but shows compliance to Economic Commission for Europe (ECE) EMC regulations.

Automotive Conformance Specification 5 is a standard used by Police & Fire Services in England and Wales.

MIL-STD-810F is a popular United States Military specification from which the shock and vibration test methods are often taken.

Vibration & Shock   **Power Supply Variation**   **-10 to 55°C**   **EMC**

Railway

- **EN 50155** is a railway standard for **rolling stock**

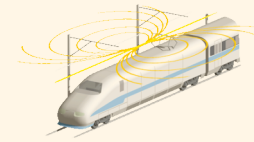- **EN 50121-4** is a railway EMC standard for **signaling and telecommunications equipment**

Vibration & Shock   **Power Supply Variation**   **-40 to 75°C**   **EMC**

Maritime

- **IEC 60945 4th Edition** is a general standard for navigation and radio communication equipment

- **DNV (Det Norske Veritas)** is a Norwegian Classification Society who issue certification for maritime devices

- **IACS E10** is a unified general standard created by the **International Association of Classification Societies**, which covers maritime computers. The DNV is one of 10 members which make up the IACS.

Vibration & Shock   **Power Supply Variation**   **-25 to 70°C**   **EMC**

Summary

EMC SPECIFICATIONS ✓

ENVIRONMENTAL SPECIFICATIONS ✓

LOW POWER ✓

DC POWER ✓

LONG TERM SUPPLY ✓

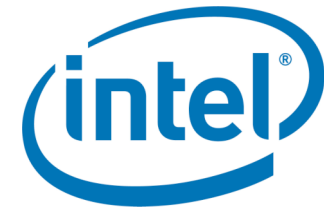REPEATABLE ✓

RELIABLE ✓

OEM BRANDING ✓

3 YEAR WARRANY ✓

ON-SITE SERVICE ✓

SUPPORT ✓

- **Thank you.**

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- Tel: +44 (0) 1273 570 220

- URL: www.amplicon.com