ADLINK
Leading EDGE COMPUTING

Application Story

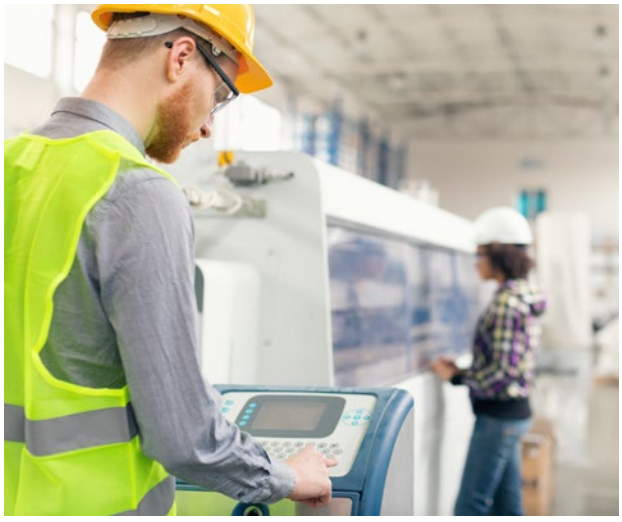
ADLINK Keeps Its ETX® Promise Seamless Changeover to Intel Atom® Technology



www.adlinktech.com

2018

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



Customers Need Uninterrupted Production

A very well-known manufacturer of production equipment is using an ETX-based industrial panel PC as the graphical human-machine interface (HMI) for their products. This solution is well accepted in the marketplace and functional upgrades can be easily implemented via software updates for years to come. Unfortunately, the widely used CPU and chipset of the ETX module (Intel Atom® Processor N270, 945GSE/ICH7M Chipset) had come to end-of-life (EOL) and last buy requests sent out by the initial module vendors. Needless to say, due to actual hardware prices, overstocking was not an attractive option and only a short-term solution at best. Due to the actual market situation with production running at maximum demand, a production stop or even a slow-down would be the last thing the manufacturer wanted. Serious implications would include lost profits and severe penalties, as well as loss of market share and reputation.

The Challenge: Continuous ETX Replacement Support

The customer wanted a quick solution with a minimum of changes to the existing solution to avoid unnecessary risks. So the challenge was to find a cost-effective solution, i.e. to find an OS-level and application-level compatible ETX replacement board which had to be supported for at least another five years. Specifically, the entire system had to be migrated from the existing module to the new one without any changes to the customer's existing ETX carrier board. The new module had to support all legacy interfaces on the carrier board in order to avoid a costly and time consuming redesign.

A modular COM system has to remain compliant to the previous solution after an upgrade to a new module. Serious COM vendors ensure this by providing application-ready OS integration for standard operating systems. Usually this integration covers all standard functions which do not use exotic hardware and utilize common application interfaces (APIs) of the OS. Nevertheless, custom features and extensions to hardware and software often require additional support for the respective drivers as well as BIOS modifications. Unfortunately, not all COM vendors can or want to provide the required level of support.

Accommodating Existing and New Interfaces

In this particular case the custom-built industrial panel PC had to be fully backward compliant and also use the benefits of the new module. A wide range of long-term available embedded processors should be supported to provide flexibility and scalability for the target solution and all legacy interface options must be available after the upgrade. To support older versions of the industrial panel PC, PATA/IDE, ISA, USB 1.1 and TTL graphics support were mandatory. In order to overcome memory and graphics timing challenges, legacy bus timing setups and custom BIOS/UEFI modifications were required.

Thermal Solution for Better Compute Performance

The performance of processor and on-chip graphics card should be scalable and operate at least at the current N270/945GSE level to leave some reserve for functional application software upgrades and new features. This includes module support for hardware video decoders, multi-display full HD resolution and standard cryptography/security technologies. With the higher efficiency of today's processors, power consumption (thermal design power, or TDP) and cooling should not be issues at all, with passive cooling being the ideal option. Not all candidates out of the remaining Bay Trail based ETX vendors could or wanted to offer this, nor were they able to offer the required level of ruggedness and extended operating temperature range of 0°C to 60°C (optional 85°C).

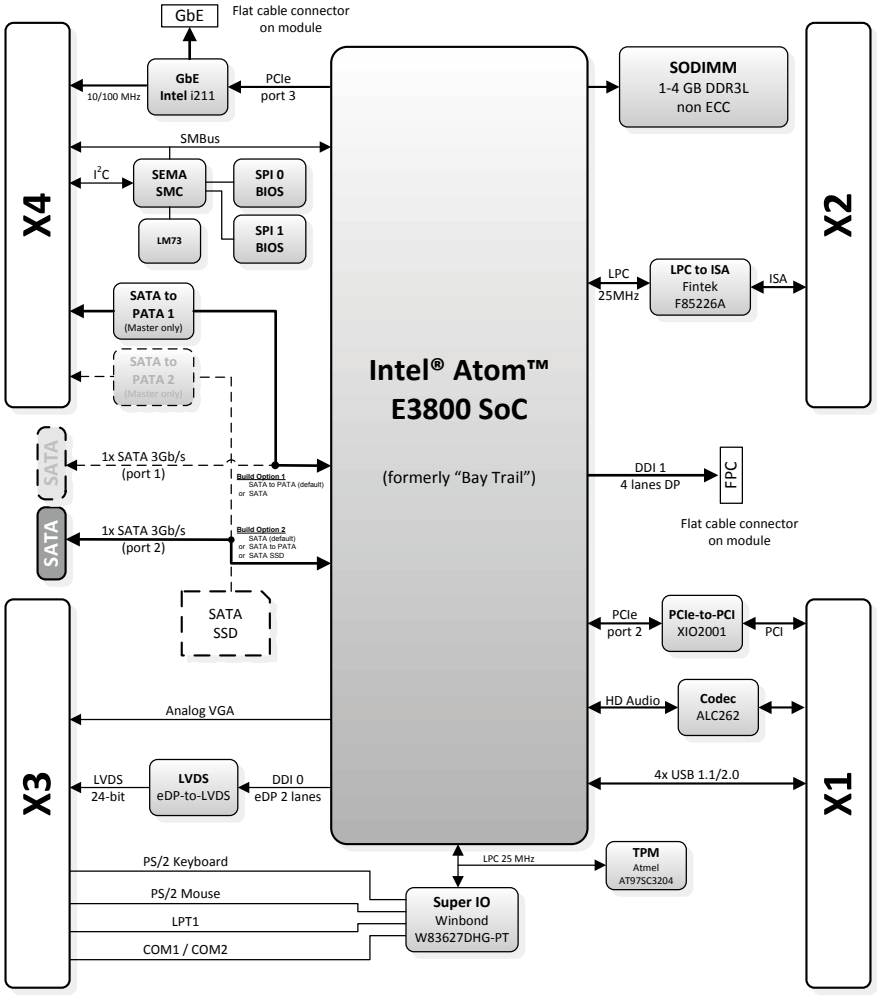
ADLINK Solution

ADLINK, a pioneer in the ETX form factor, has the know-how and experience to adapt and integrate legacy interfaces with latest high performance, low power consumption processor technology. Redesigns can benefit from compatibility with older ETX systems and the preservation of legacy interface options.

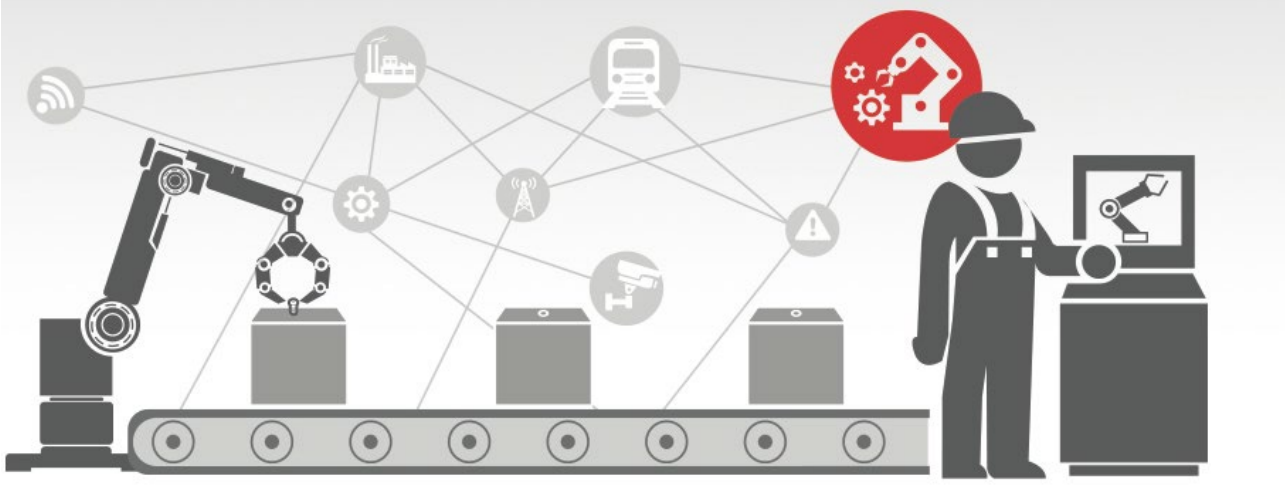
In this particular case, ADLINK's ETX-BT module based on the Intel Atom® processors E3800 was chosen for its best fit to replace the old Intel Atom® N270 solution running Windows 7. While the OS itself and standard functions/applications were running smoothly with the customer's unmodified carrier board, an existing USB extender function required firmware modifications to fix timing issues. Other specific modifications required by the customer were modified VGA timing to add 60 Hz support for the LVDS interface to eliminate interference with specific displays and specific power-up menus for secure boot device selection.

The ADLINK ETX-BT easily delivered all required interfaces. ISA support is implemented using an LPC-to-ISA bridge and two native SATA 3GB/s ports can each be alternatively configured to PATA/IDE (Master only) using a SATA-to-PATA bridge as a build option. Optionally, one of the SATA ports can even be used for an on-module SSD. In its standard configuration, the ADLINK ETX-BT module comes with one SATA 3GB/s and one PATA port. To meet customer requirements such as those above, ADLINK operates a professional support group to modify systems on demand for non-standard customer requests.

Functional Diagram



LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000



ADLINK Solution Benefits

The customer was now able to upgrade their industrial panel PC family by simply repopulating the existing carrier board with the new ETX-BT module and the accompanying thermal interface/heat spreader. No further changes to the industrial panel PC housing were required. All necessary adaptations and firmware changes were performed by ADLINK's professional support services within a few weeks, saving the customer significant amounts of money by avoiding unnecessary "last buy" stock-ups. The new ETX-BT module adds much more graphics and computing performance at significantly lower power consumption and brings the benefit of longer system availability without the need for tedious hardware development effort.

The new features enabled by the migration to the ETX-BT add new functionalities and allow lower business risks. A good example is ADLINK's Smart Embedded Management Agent (SEMA®). SEMA allows system operators to remotely monitor the hardware and operating status of all onboard units and administer maintenance and repair tasks. This is particularly beneficial at large industrial production sites that stretch over wide areas and have many devices installed. SEMA helps increase uptime and productivity for the end customer. Other features include an optional hardware security module (Trusted Platform Module, or TPM) and Gigabit Ethernet Interfaces, which together enable faster data transmission and encrypted technology to reduce risks. The ETX 3.02 standard has solved the problem of adding SATA support by implementing low profile onboard interfaces directly on the ETX module while maintaining complete compatibility with the original ETX form factor and all its legacy interfaces. By upgrading to the ETX-BT using the existing ETX carrier board, the customer incurs lower development costs while simultaneously increasing performance.



ETX-BT : ETX Module with Intel Atom® Processor E3800 Series SoC

- Up to 4 GB non-ECC DDR3L at 1333 MHz
- Dual channel 24-bit LVDS and VGA
- 2x SATA or 2x PATA (Master only), 4x USB 2.0, 10/100 Mbps LAN (GbE via onboard connector)
- Extreme Rugged operating temperature: -40° to +85° (opt.)
- Supports Smart Embedded Management Agent (SEMA) functions

Conclusion

ADLINK's ETX-BT module delivers all the legacy features of the ETX form factor, as well as the advantages of the latest high speed interfaces and ADLINK's own technologies. Compared to other solutions, ADLINK's Intel Atom® based ETX solution provides maximum native compatibility with legacy ETX modules based on the Intel Atom® Processor N270, as well as Pentium® M and Core™2 Duo processors. Necessary modifications resulting from the customer's specific requirements can be solved by ADLINK's professional services in a short time, reducing customer effort and expenditure. The guaranteed long term availability of at least another seven years for ADLINK's Intel Atom® based ETX solution results in a very low total cost of ownership (TCO) and therefore increased profits on the customer side. In the current environment, the technologically updated ADLINK ETX solution proved to be significantly more cost effective and less risk-prone than a complete change of the existing platform.

About ADLINK

ADLINK Technology is enabling the Internet of Things (IoT) with innovative embedded computing solutions for edge devices, intelligent gateways and cloud services. ADLINK's products are application-ready for industrial automation, communications, medical, defense, transportation, and infotainment industries. Our product range includes motherboards, blades, chassis, modules, and systems based on industry standard form factors, as well as an extensive line of test & measurement products and smart touch computers, displays and handhelds that support the global transition to always connected systems. Many products are Extreme Rugged, supporting extended temperature ranges, shock and vibration.

ADLINK is a Premier Member of the Intel Internet of Things Solutions Alliance and is active in several standards organizations, including PCI Industrial Computer Manufacturers Group (PICMG), PXI Systems Alliance (PXISA), and Standardization Group for Embedded Technologies (SGeT).

ADLINK is a global company with headquarters in Taiwan and manufacturing in Taiwan and China; R&D and integration in Taiwan, China, the US, and Germany; and an extensive network of worldwide sales and support offices. ADLINK is ISO-9001, ISO-14001, ISO-13485 and TL9000 certified and is publicly traded on the TAIEX Taiwan Stock Exchange (stock code: 6166).

WORLDWIDE OFFICES

ADLINK Technology, Inc.

9F, No.166 Jian Yi Road, Zhonghe District
New Taipei City 235, Taiwan
新北市中和區建一路166號9樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.

5215 Hellyer Avenue, #110 San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology Singapore Pte, Ltd.

84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)

#50-56, First Floor, Spearhead Towers
Margosa Main Road (between 16th/17th Cross)
Malleswaram, Bangalore - 560 055, India
Tel: +91-80-65605817, +91-80-42246107
Fax: +91-80-23464606
Email: india@adlinktech.com

ADLINK Technology Japan Corporation

東京本社 (Tokyo Office)
〒101-0045 東京都千代田区神田鍛冶町3-7-4
ユニゾ神田鍛冶町三丁目ビル4F
Unizo Kanda Kaji-cho 3 Chome Bldg.
4F, 3-7-4 Kanda Kajicho, Chiyoda-ku, Tokyo 101-0045, Japan
Tel: +81 3 4455-3722
Fax: +81 3 5209-6013
Email: japan@adlinktech.com

西日本支社 (Nagoya)
〒450-0002 愛知県名古屋市中村区名駅5-31-10
リンクス名駅ビル3F
LINKS Meieki Bldg. 3F, 5-31-10 Meieki, Nakamura-ku,
Nagoya-city, Aichi 450-0002, Japan
Tel: +81 52 589-9018
Fax: +81 52 583-2807
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)

경기도 성남시 분당구 수내로46번길4 경동빌딩 2층
(수내동 4-4번지) (우) 463-825
2F, Kyungdong B/D, 4 Sunae-ro 46beon-gil, Bundang-gu,
Seongnam-si, Gyeonggi-do, Korea, 463-825
Toll Free:+82-80-800-0585
Tel: +82-31-786-0585
Fax: +82-31-786-0583
Email: korea@adlinktech.com

ADLINK Technology, Inc. (Israel Liaison Office)

SPACES OXYGEN
62 Medinat, Ha-yehudim st
4673300, Herzliya, Israel
P.O.Box – 12960 Tel: +972 54 632 5251
Fax: +972 77 208 0230
Mobile: +972 546325251
Email: israel@adlinktech.com

ADLINK Technology (China) Co., Ltd.

上海市浦东新区张江高科技园区芳春路300号 (201203)
300 Fang Chun Rd., Zhangjiang Hi-Tech Park
Pudong New Area, Shanghai, 201203 China
Tel: +86-21-5132-8988
Fax: +86-21-5192-3588
Email: market@adlinktech.com

ADLINK Technology Beijing

北京市海淀区上地东路1号盈创动力大厦E座801室(100085)
Rm. 801, Power Creative E, No. 1 Shang Di East Rd.
Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8626
Email: market@adlinktech.com

ADLINK Technology Shenzhen

深圳市南山区科技园南区高新南七道数字技术园
A1栋2楼C区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

ADLINK Technology GmbH

(Mannheim) Hans-Thoma-Strasse 11, D-68163
Mannheim, Germany
Tel: +49 621 43214-0
Fax: +49 621 43214-30

(Deggendorf) Ulrichsbergerstrasse 17, 94469
Deggendorf, Germany
Tel: +49 (0) 991 290 94-10
Tel: +49 (0) 991 290 94-29
Email: emea@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)

6 allée de Londres, Immeuble Ceylan 91940
Les Ulis, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology, Inc. (UK Liaison Office)

First Floor West Exeter House, Chichester Fields
Business Park Tangmere, West Sussex,
PO20 2FU, United Kingdom
Tel: +44-1243-859677
Email: UK@adlinktech.com

ADLINK Technology SARL

28 rue Jean Rostand, 91400 Orsay,
France
Tel: +33 (1) 70 778200
Sales: +33 (1) 70 791378
Email: ist_info@adlinktech.com

ADLINK
Leading EDGE COMPUTING

All products and company names listed are trademarks or trade names of their respective companies.
All specifications are subject to change without further notice.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000