EUROTECH
Imagine. Build. Succeed.

Working with Eurotech

Three Ways to Buy Embedded Computer Technology: Boards, Custom Products and Architected Designs

OVERVIEW

Eurotech offers both ready-to-use devices and embedded systems for incorporation into an OEM device. When the customer wants a board component for their system, we work with them to achieve maximum cost efficiencies through the "DIME" model of product lifecycle cost (Design, factory Introduction, Maintenance, and EOL considerations). Within this the DIME business model, we offer options to OEMs with varying production volumes and varying control on their supply chain. This whitepaper will explain the parameters an OEM can evaluate when picking a preferred sourcing agreement.

Figure 1 - Eurotech starts the customer relationship for an embedded board with a development system.

Eurotech starts the customer relationship for an embedded board with a development system (Figure 1). Built around one of our stocked products, the development system exposes the rich I/O subsystems for which Eurotech is known.

These Eurotech development systems have optimized, efficient Windows Embedded or Linux development kits and can be easily adapted to many products off-the-shelf. Eurotech also offers custom software builds, fully optimized hardware and software solutions, and even design packages under an architected production license for high volume customers.

INTRODUCTION

The needs of the commercial/industrial OEM are varied. Production volume might vary between a few tens to many tens of thousands per year. Time to market might be constrained by key events like predecessor product end of life, or might be open, limited only by project cost. Devices might face very particular certification and approval barriers, and might have specific requirements for product lifetime. Finally, the OEM's target device costs could vary from a couple of hundred dollars to many tens of thousands of dollars. Eurotech's objective is to

meet all these needs with an appropriate production relationship.

In general, Eurotech customers engage with us around our primary stocked products or COTS devices, optimized design/build and architected production license agreements. While annual production volume is the principal determinant in shaping this relationship, there are other considerations as well. Figure 3 indicates the general breakpoints for engagement for an OEM build. In each case, Eurotech provides the complete design and maintenance support. As the costs go down and volume goes up, the customer becomes more committed to both the supply chain and its control.

OEM SYSTEMS BASED ON STOCKED PRODUCTS

Eurotech builds several of its more popular designs for stock. This means the product can be purchased in low unit quantities off-the-shelf for payment and cancellation terms appropriate for stocked products. In this arrangement it is Eurotech, not the customer, who is responsible for meeting production volume commitments and holding price down for the dozens of suppliers of the hundreds of components on the board. Eurotech takes responsibility for maintenance of the design and qualification, updates and adaptations as the specifications and availability of parts change.

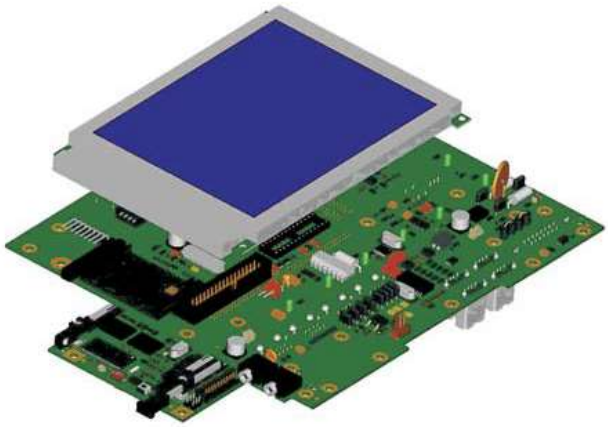

Figure 2 - A standard Eurotech system can mate with a low cost custom connector to create an easy-to-assemble product perfect for the low volume OEM.

Various stocked products can be used in this way. The powerful Catalyst series of embedded modules offer low power flexibility while enabling the full feature set of a powerful processor family. And of course, there are a variety of standard boards with PC/104, CompactPCI, VME and other common interfaces.

The off-the-shelf option is frequently customized to some extent (Figure 2). For example, many OEMs have a custom, built-to-order OS for their

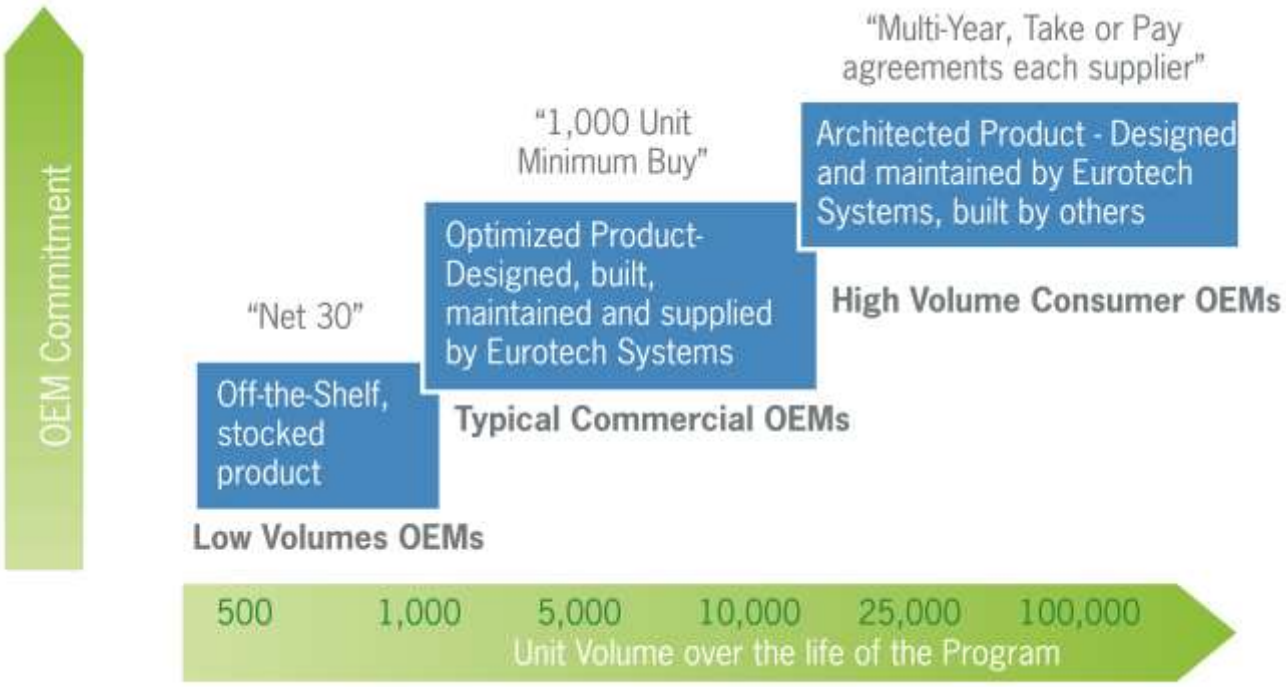

Figure 3 - Sourcing Agreements with Eurotech. As the OEM takes more responsibility for the supply chain, the product unit cost goes down.

configuration. The Windows Embedded and Linux distributions are huge, and building a 'one size fits all' embedded configuration is not efficient. At nominal cost, Eurotech can provide the specific OS configuration the OEM requires for the application.

At the higher end of the stocked product volume curve, where the customer can commit to a specific volume production run, Eurotech can depopulate standard configurations to reduce cost.

One of the more interesting adaptations of the stocked product business model is for devices subject to FDA or other approval that mandate no component changes without specific notifications and recertification. In these situations, Eurotech has a service to essentially convert the standard product to a custom product where any change to a Bill of Material (BOM), perhaps forced by component obsolescence, is flagged to the OEM and an agreeable path forward is developed. This is contrary to most COTS suppliers who will change out generations of components on product as fast as they can to keep the product current and cost low.

Even the low volume customer is assured of continuity of supply with the stocked product option, without the need to engage in lifetime buys or

extended purchase commitments. In addition, for some products like the Catalyst series, Eurotech has been supporting the same form factor and pin-out configuration for multiple generations of processors allowing the user the possibility of continuous supply over many years.

Finally, many of the customers for stocked products retain Eurotech to develop custom connector boards. Working with the customer, Eurotech is able to quickly spin a motherboard for the stocked product, which will include the connectors, I/O subsystems, and other electronics the customer needs. This can include the customers' own proprietary circuits and designs. Eurotech can build and supply these boards economically because they are sourced through manufacturing facilities specifically chosen for short-run production of basic designs. With Eurotech doing the design for the stocked product and the connector board, design responsibility is not divided.

THE OPTIMIZED OEM SOLUTION

Some Eurotech customers opt for optimized, custom solutions to meet their application needs. Benefits, costs and risks balance nicely, whether the OEM is consuming one to ten thousand units per year.

Benefits are high. An optimized custom design gives the OEM exactly the configuration they want, on a single board of the size they need (Figure 4). Proprietary circuitry and electronics can be incorporated, and no extra parts complicate the bill of material. The manufacturing process, test fixtures, and test procedures are tuned exactly to that particular device.

The process is simple - Eurotech will sit down with the OEM to gather information, and then the Eurotech team will first develop a Statement of Work (SOW) to be agreed upon, then present a Solution Design for verification and approval by the client before any project work commences.

While there is typically a non-recurring charge to configure the Eurotech technology for the particular device, this fee is seldom more than 10 to 20 percent of the first year's start-up inventory costs. Comparatively, Eurotech often delivers the first 1000 units of inventory as designated in the SOW for less than most design firms charge for just paper designs and a hand built prototype.

Test equipment and prototype devices are typically part of the SOW. Since the optimized design has no components other than those demanded by the application, product costs are minimum. An even

larger benefit of the custom design process is the ability to integrate secondary sensor and I/O boards, further condensing costs.

Figure 4 - Optimized products can be engineered precisely to fit the space available and work with the selected components putting the OEM more in charge of the supply chain.

For the OEM the project risk for the optimized design is apportioned agreeably. Unlike typical embedded system projects that are estimated in months and often run to years, most Eurotech projects deliver first article production in 9 to 16 weeks. Also, with the optimized option, Eurotech assumes all supply side risk such as component obsolescence, spec changes, limited availability and allocation. Eurotech assumes this risk and its consequential maintenance cost for the duration of the product lifetime.

Of course, at this level of commitment, the OEM assumes some level of market risk. Since only a nominal charge is made for the design and introduction effort, Eurotech does not normally undertake an optimized build unless the OEM is committed to take at least 1000 units of production.

There is an interesting variation on this model when the customer requires a fully built, assembled unit, for example a unit packed for shipment to the end user. In these situations, Eurotech typically works with one of our contract manufacturers (CMs) who will include plastic molding, cabling, assembly, test, and packaging in their facility. The Eurotech custom board is sold in place to the customer or the CM at the facility, and then becomes part of the device the CM builds for the OEM. The accounting might look like two suppliers, but the material flow is exactly the same as a turnkey product giving the OEM the simple supply chain many of them want.

ARCHITECTED PRODUCTION

A few of Eurotech's customers reach high volume production where their products' supply chain could become the tail wagging the Eurotech dog.

In these situations, it is best for the customer to assume management of the supply chain directly, in a manufacturing facility of their choice. Most often, this occurs where a product must be built off shore, and must be built as a consumer-ready turnkey device. Sometimes this option is also merited for devices that must be built in controlled facilities, for example devices used for DoD equipment. In either case, the CM takes full custody of design deliverables such as BOM, schematics and BSPs. Eurotech does not transfer these designs without support. Usually, extensive work, on the order of hundreds of man-hours, is required to qualify and approve the parts and processes available at the designated CM. Eurotech works with the CM to coordinate standards for information exchange, and we keep the master design database active and current for the duration of production.

As is typical for such architected production arrangements, these designs are transferred under limited license, usually to the OEM who holds the CM responsible as the subcontractor. The terms of the license are generally limited to the use for the particular device and for any changes required to maintain the device in production. The terms of payment for the license are spread out, with an initial one time technology transfer fee and the rest paid as a per-unit cost consisting of declining production license and a fixed per-unit maintenance and support fee. This option improves the OEM's cash flow versus the more typical up front licenses usually required by design firms.

As with the optimized design and stocked product options, Eurotech never walks away from the maintenance responsibility for the design. For a fixed price per unit, Eurotech will maintain staff and expertise to address any issues with component qualification or other details that arise during product lifetime.

Eurotech contends for business against design firms, contract manufacturers and standard product suppliers. We feel our core value is allowing the customer to pick their preferred form of supply agreement, independent of the design itself. It is our mission to supply value through the product lifecycle, no matter how our customers engage.

WHY CHOOSE? TRANSITION!

Which is the correct option for a particular OEM? The best relationship may transition through the various business models.

Concept can be proven with stocked products. Introduction and the first few thousand units can be

provided via an optimized design/build arrangement. If the market is receptive, an eventual architected production can be manufactured under a license. This transition model can be especially valuable to VC funded startups that must conserve capital for needed market and technology development during their initial growth stages, and then capture more margins by controlling the supply chain as they move into potentially large markets.

SUMMARY

As the selection is made, the OEM should always remember that for stocked product, optimized product or architected production license, whatever the choice, Eurotech will collaborate for the full product lifecycle of Design, factory Introduction, Maintenance, and EOL considerations.

One Thin Dime

Eurotech has an unusual business model. We aren't a design firm: we stay with you for the full product lifecycle. We aren't a CM: we have our own technology. We aren't a standard product firm: our product roadmap is your product roadmap.

What we are is your partner, through the cycle of Design, Introduction, Manufacture / Maintenance and End-of-Life. Contact us about your next program, and ask us about the DIME.

For further information on Eurotech products and solutions, please visit www.eurotech.com or send an email at sales@eurotech.com.