NLX I/O Shield Design Suggestions

Version 1.0

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1. Objective

This design guide has been prepared to assist motherboard vendors and I/O shield vendors with developing I/O shield solutions based on the NLX form factor. The NLX specification describes an I/O back panel aperture, within which any number of different I/O connector configurations may be offered. This guide documents the connector positions for some of the current motherboard designs and is provided to you subject to the disclaimer above.

The intention of the core designs is to standardize board connector placements and minimize the number of custom shield designs. It is not necessary to follow this guide to be compliant with the NLX specification, but following it will help to promote standardization in the industry for NLX I/O shield designs.

2. I/O Shield Design

Irrespective of the connector configuration implemented for an NLX I/O shield, the outer perimeter will remain constant across multiple shield designs. There are many design possibilities that are all NLX-compliant. The motherboard attachment method is one of the key concepts that may vary. The design shown in this guide uses a snap-on two-piece design for the I/O shield. Alternate designs may use more conventional methods for attachment, such as retaining the I/O shield to the motherboard via the jack screws on connectors such as serial, parallel, and video connectors.

Figure 1 shows a drawing of a snap-on I/O shield for an NLX motherboard. The advantage of this type of design is that it does not rely on the availability of jack screws for connection to the motherboard. This type of shield also takes very little effort to integrate onto the motherboard.

An NLX motherboard that accepts the shield shown in Figure 1 is required to have features that are not part of the NLX specification. These features are shown in Figure 2. They allow the I/O shield to attach to the motherboard without the need for connector attachment. Lead in and connector edge details are shown in Figure 2 and are required on the motherboard if a standard snap-on I/O shield is to be used.

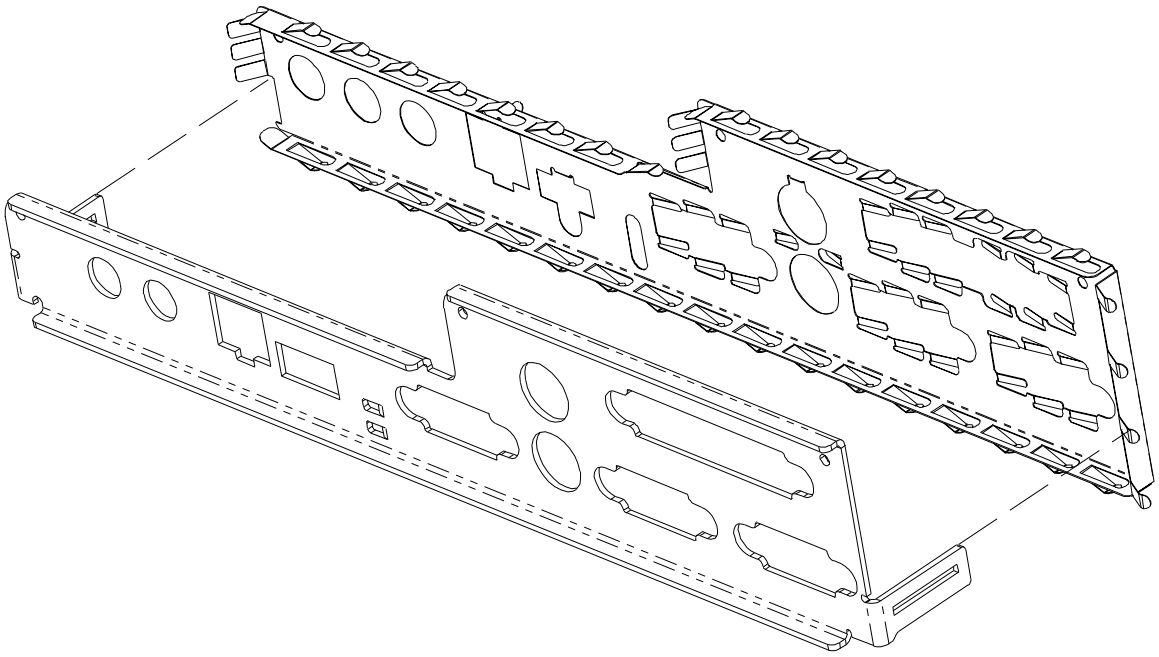

Figure 1: Snap-on NLX I/O Shield

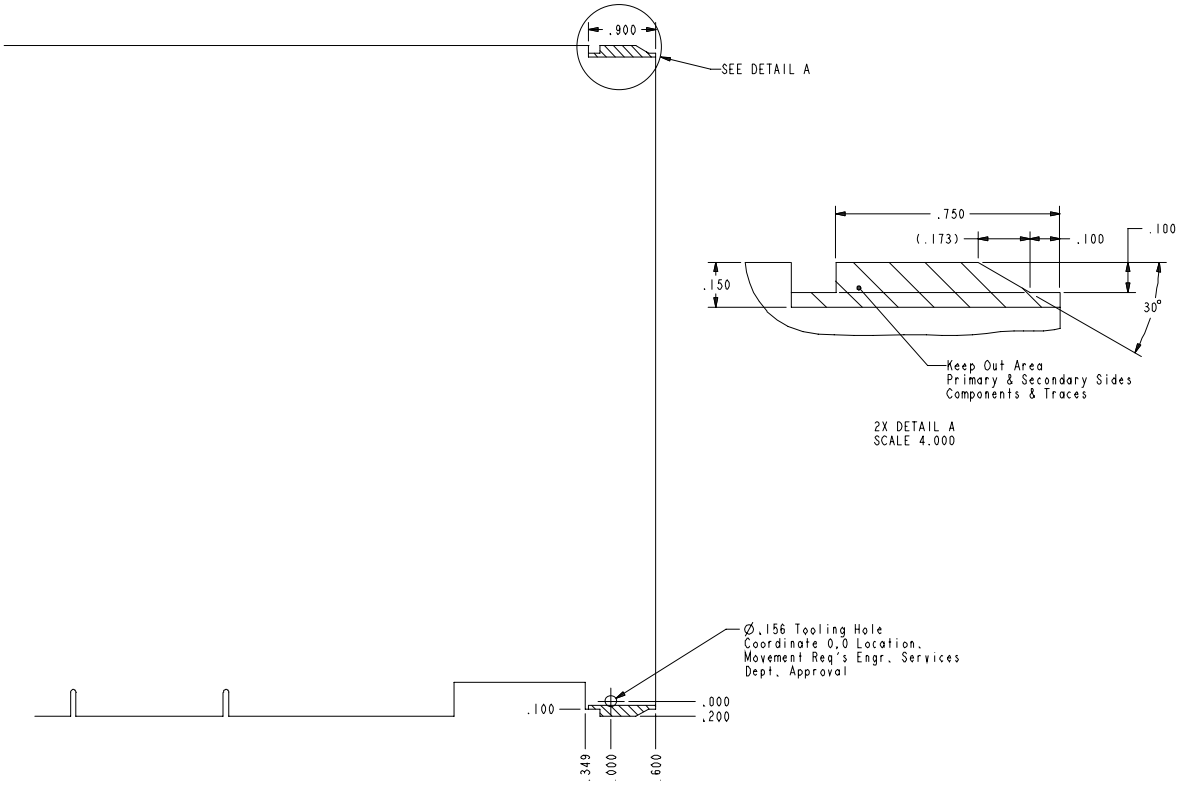

Figure 2: Motherboard Features for Snap-on NLX I/O Shield

3. Core Design Concept

Most I/O shields for current NLX motherboards are based on the core design included in this guide. Individual motherboards using the core design may not implement all of the connector locations on the I/O shield. This allows progressive tooling to be used to produce the widest range of shields by simply inserting or removing the required dies as well as pulling punches. This will maintain the integrity of the shield periphery, which will remain constant.

For example, the same core design may be used for two different motherboards. One motherboard may use one subset of connectors from a core design, and the other may use a different subset of connectors. Figure 3 is an example of this circumstance. In this case, both motherboards use a subset of core design #1 (see Figure 4).

- The first board has a keyboard, mouse, parallel port, and two serial ports.
- The second board with the enhanced feature set uses additional features for a USB connector and three submini-audio connectors.

Because both are subsets of the core 1 layout, they use the same progressive tooling setup with a variation on the punching stages inserted. In the case of a new core design, a new set of core stages can be made with little impact to the overall tool. The core stages can then be used with the existing periphery dies to produce a new part. This can minimize time and tool costs if a new connector set is required.

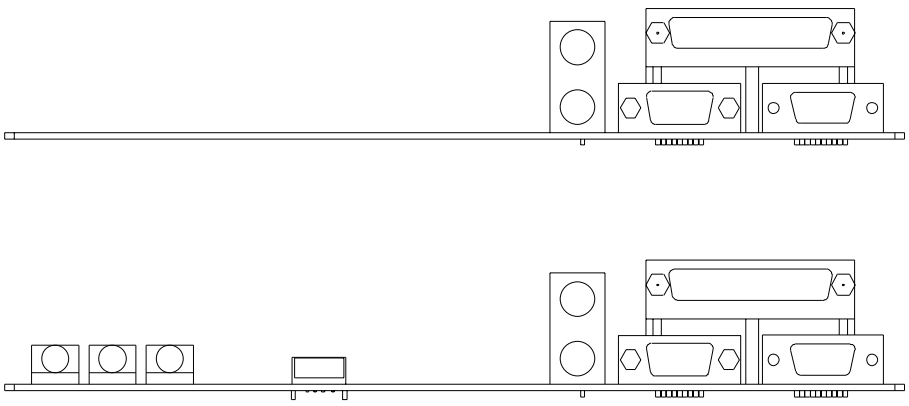

Figure 3: Core Design Usage Example

4. Core Designs

Figure 4 shows the core design that is currently identified for NLX I/O shields. As new features are added to motherboards, or the need for an alternate design is identified, the list of core designs will be updated to reflect those designs. It is to the advantage of all parties associated to use common configurations when possible. If a configuration is needed outside of this list, and you feel the list needs to be updated to reflect this layout, please present a request for an update through the NLX web site.

The measurements shown indicate that the centerline of each connector is measured from the left rear edge of the motherboard, which correlates to the left inside edge of the I/O aperture. Measurements are based on a standard connector type as listed following each core design. If an alternate connector type is used, the opening for the connector will need to be adjusted to allow for the connector implemented.

All core designs are based on boards with any subset of the following features. The board placement pin 1 location is shown for all connectors listed. They are located by using a 0,0 board position that is called out in each diagram. The exact positions should be verified if using an equivalent connector.

A. Parallel, 25 pin D-sub	AMP 787812-1 or equivalent
B. Serial, 9 pin D-sub	AMP 787650-4 or equivalent
C. Video, 15 pin HD D-sub	FOXCONN DZ11A36-B9 or equivalent
D. Mouse/keyboard, stack cir. DIN	FOXCONN MH11067-D2 or equivalent
E. Audio, 5 pin	SHOGYO INTNL. SJS-0349A-5P-U or equivalent
F. RJ45 connector	AMP 569564-1 or equivalent
G. USB single height	FOXCONN UB1112C-K1 or equivalent
H. USB dual stack	FOXCONN UB1112C-D1 or equivalent
I. DB15 MIDI/game port	AMP 787201-4 or equivalent
J. RCA connector	HOSIDEN AMERICA JPJ1225-01-040 or equivalent
K. 1394 fire wire	MOLEX SD-53460-0611 or equivalent
L. Optical, SP/DIF	SHARP ELECTRONICS GP1F31T or equivalent

NOTE

More core designs will be provided in future releases of this document.

4.1 Core Design #1

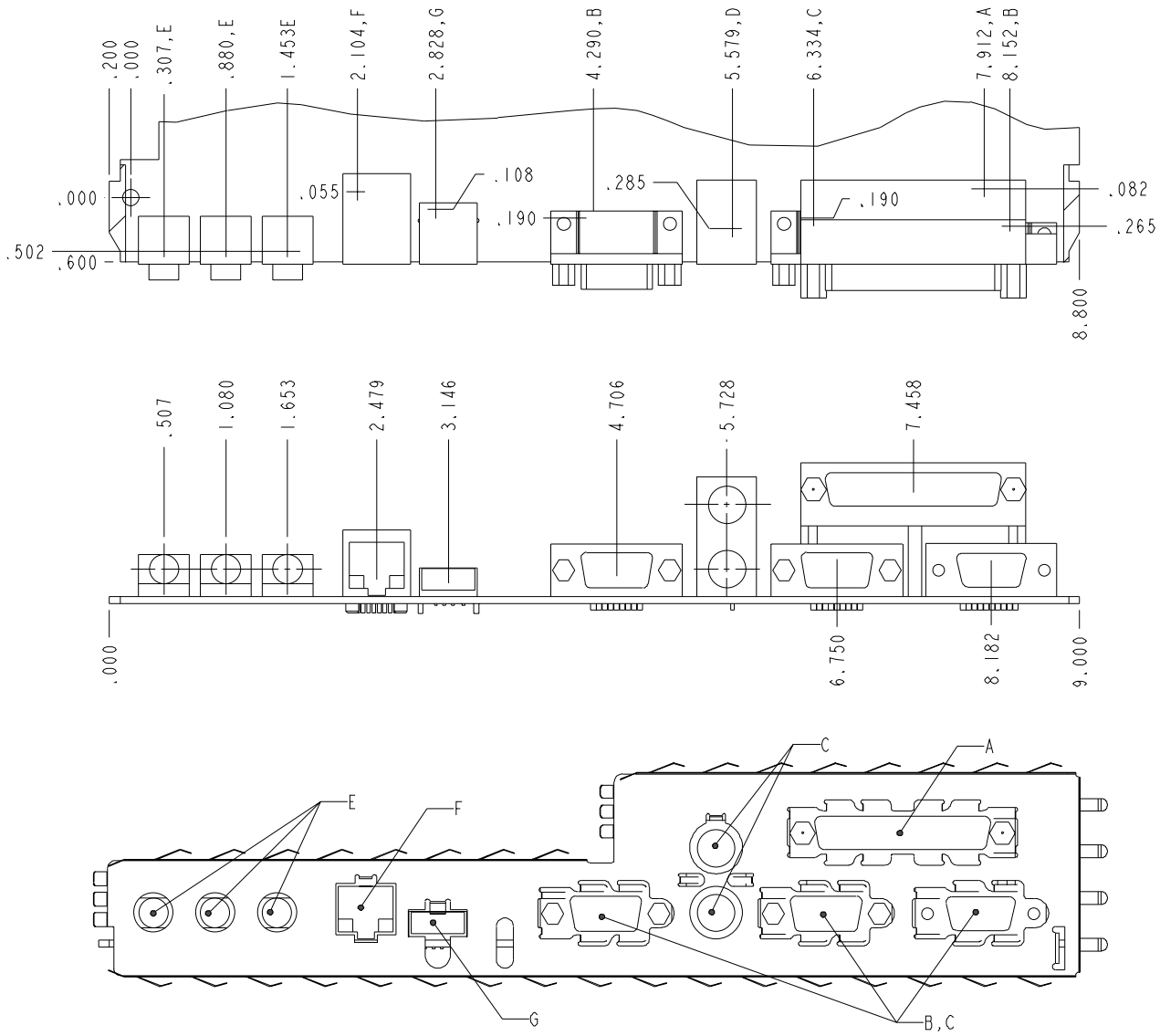

Figure 4: Core Design #1 Drawing