# Configuration of the reference chambers at ISCT

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**Abstract**

Wire configurations of the reference chambers integrated into the NEOLIS drift chamber test bench are summarized.

## 1 Reference chambers used in the performance test of the NEOLIS prototype drift chamber

The NEOLIS prototype drift chamber is sandwiched by two reference drift chambers in the above and below. The track information deduced by the reference chambers is used to test various properties of the prototype chamber, such as the position resolution, the resolving power (capability) of the left-right ambiguity, and the gas dependence of these properties.

The technical drawing of this chamber has been posted at the Web page [1]. In this report, geometry information (mostly wire configuration) of the reference chamber, given in this technical drawing, is extracted and presented in the forms of Tables and Figures.

## 2 Coordinate system

The coordinate system used is the right-handed system. Z-axis is defined as the direction of the beam. Y-axis is normal to the beam direction (Z-axis) and pointing to the upright direction. X-axis is normal to the beam direction (Z-axis) and pointing to the left direction, so that the outer product of Y and Z unit axis vectors coincides with the unit vector along the X-axis. The origin of the Z-axis is taken to the center of the reference chamber. Side view of the reference chamber is depicted in Fig. 1. Z position of each sense plane is given in the third column of Table 1.

## 3 Wire configurations

Wire configurations (printed circuit board configurations) of all planes are depicted in Fig. 2 through Fig. 5 for X planes and in Fig. 6 through Fig. 9 for Y planes. In each figure, wire numbers (W#) and the signal input/output channel numbers of the ASD card (ASD ch) are indicated. The correspondence between W# and ASD ch

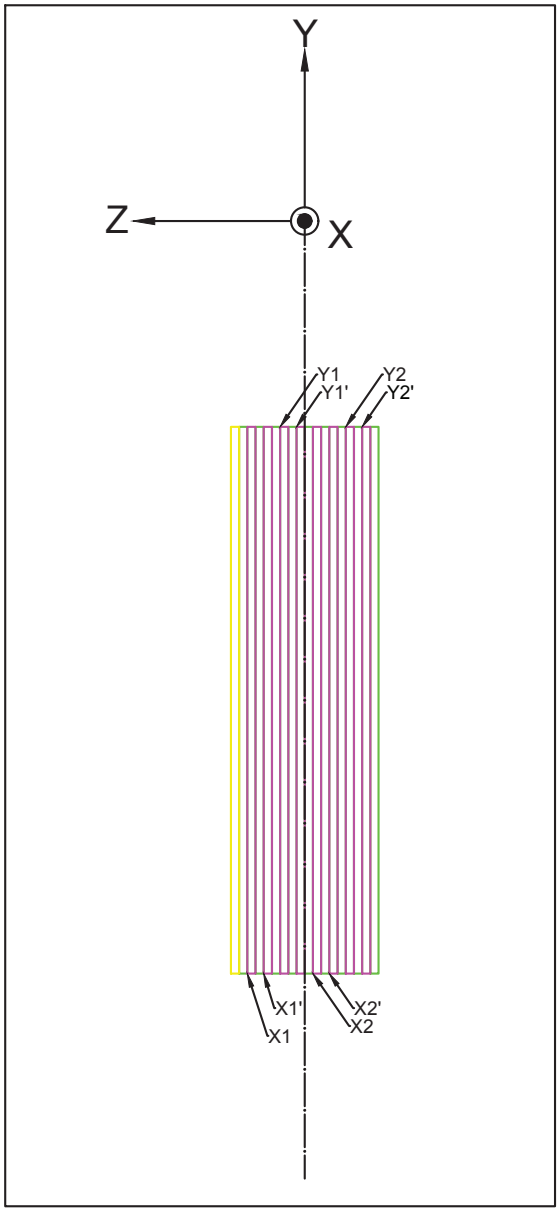


Figure 1: Side view of the reference chamber. Plane name, here, follows that in the technical drawing [1].

Table 1: Central wire (cw) and Z position (zw) of each sense plane. Plane name conforms to that in the technical drawing [1].

| Plane name | Central wire (cw) | Z position (zw) (mm) |
|---|---|---|
| X1-plane | 8.75 | 21.0 |
| X'1-plane | 8.25 | 15.0 |
| X2-plane | 8.75 | −3.0 |
| X'2-plane | 8.25 | −9.0 |
| Y1-plane | 8.25 | 9.0 |
| Y'1-plane | 8.75 | 3.0 |
| Y2-plane | 8.25 | −15.0 |
| Y'2-plane | 8.75 | −21.0 |

is provided in Table 2 for X planes, and in Table 3 for Y planes. (Virtual) central wire position of each sense plane that can be read from these drawings is given in the second column of Table 1.

# References

[1] NDC drawings (TECHNOLAND, 2009).

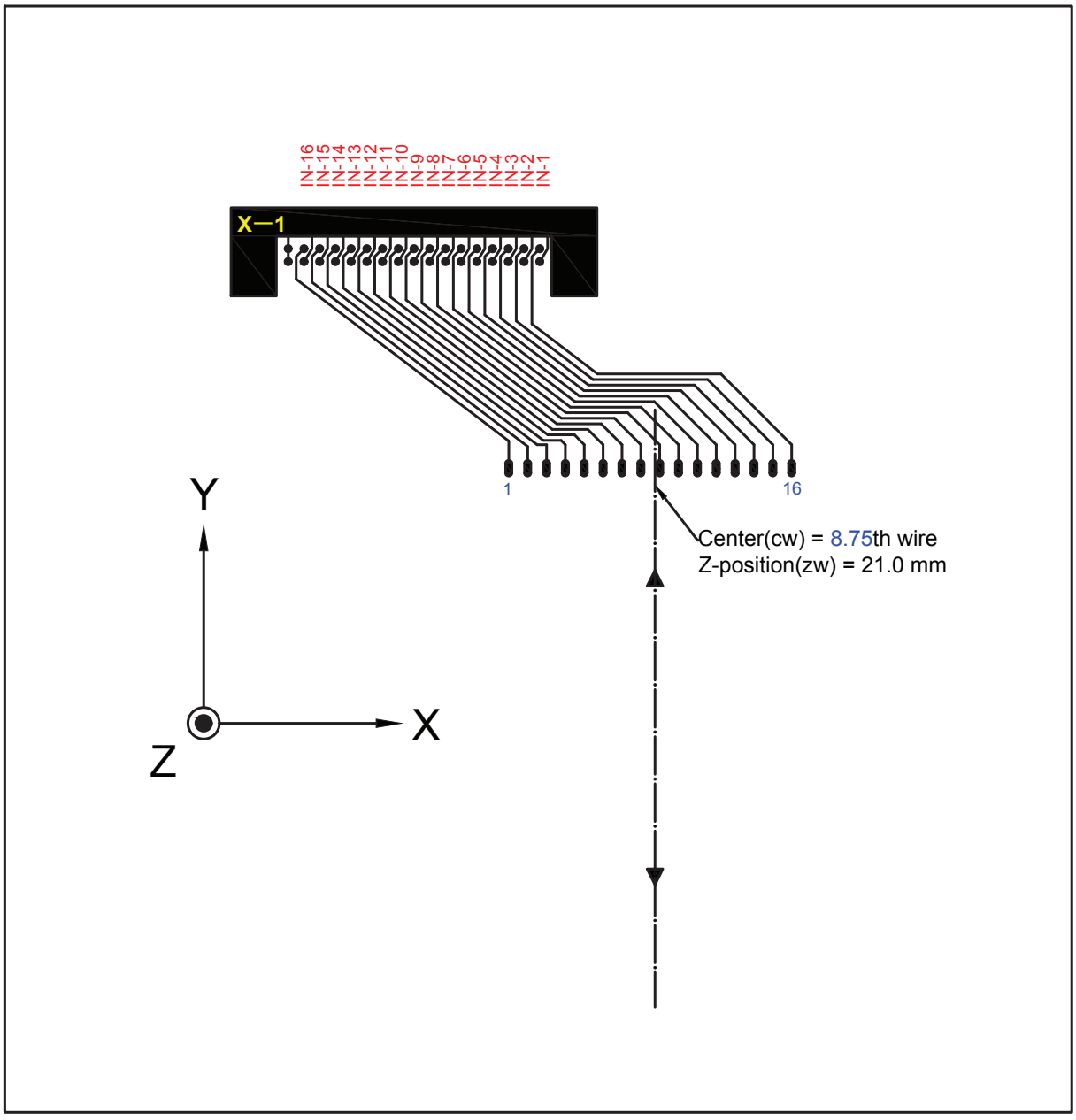


Figure 2: Wire configuration for the X1 plane.

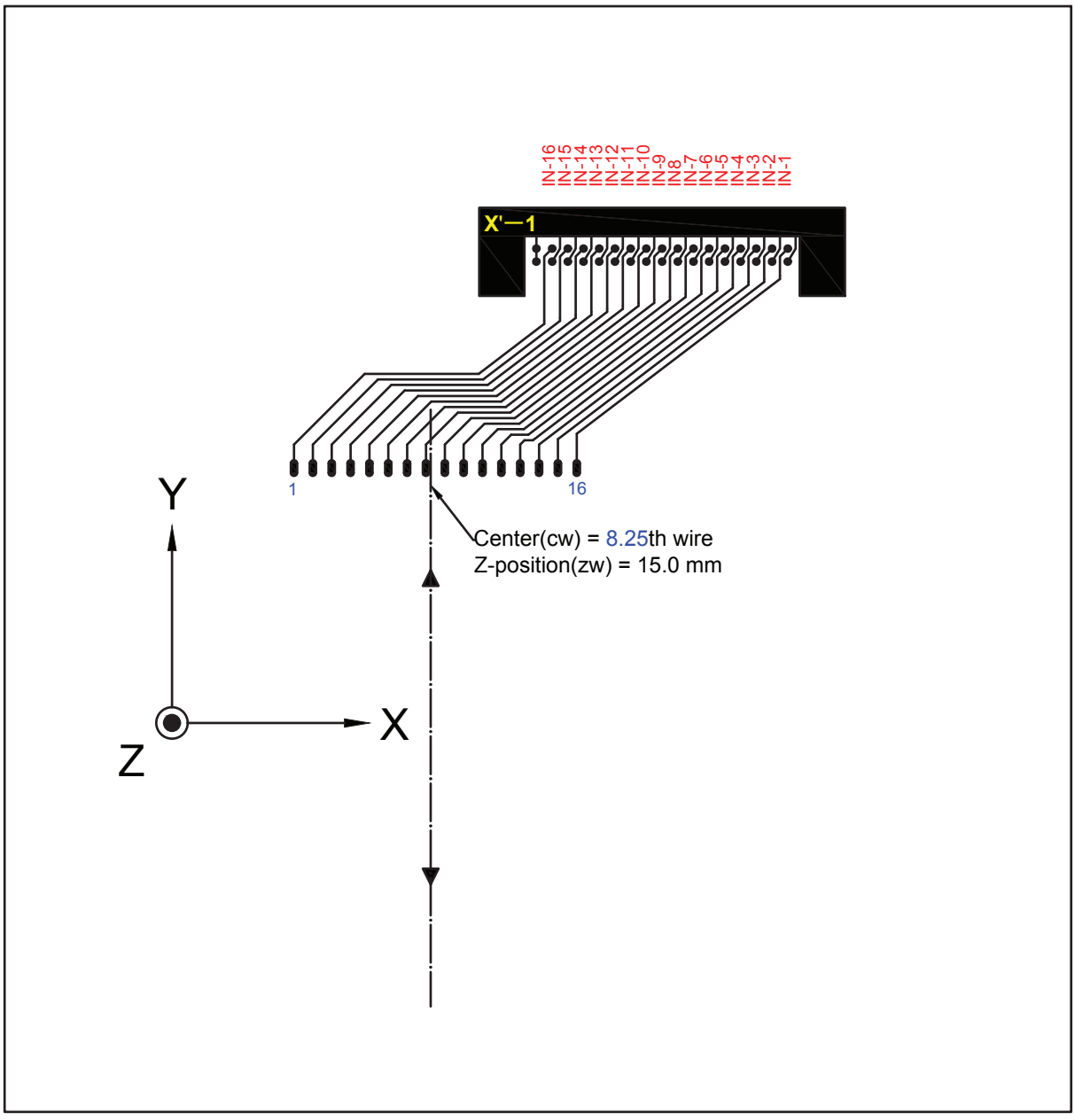


Figure 3: Wire configuration for the X'1 plane.

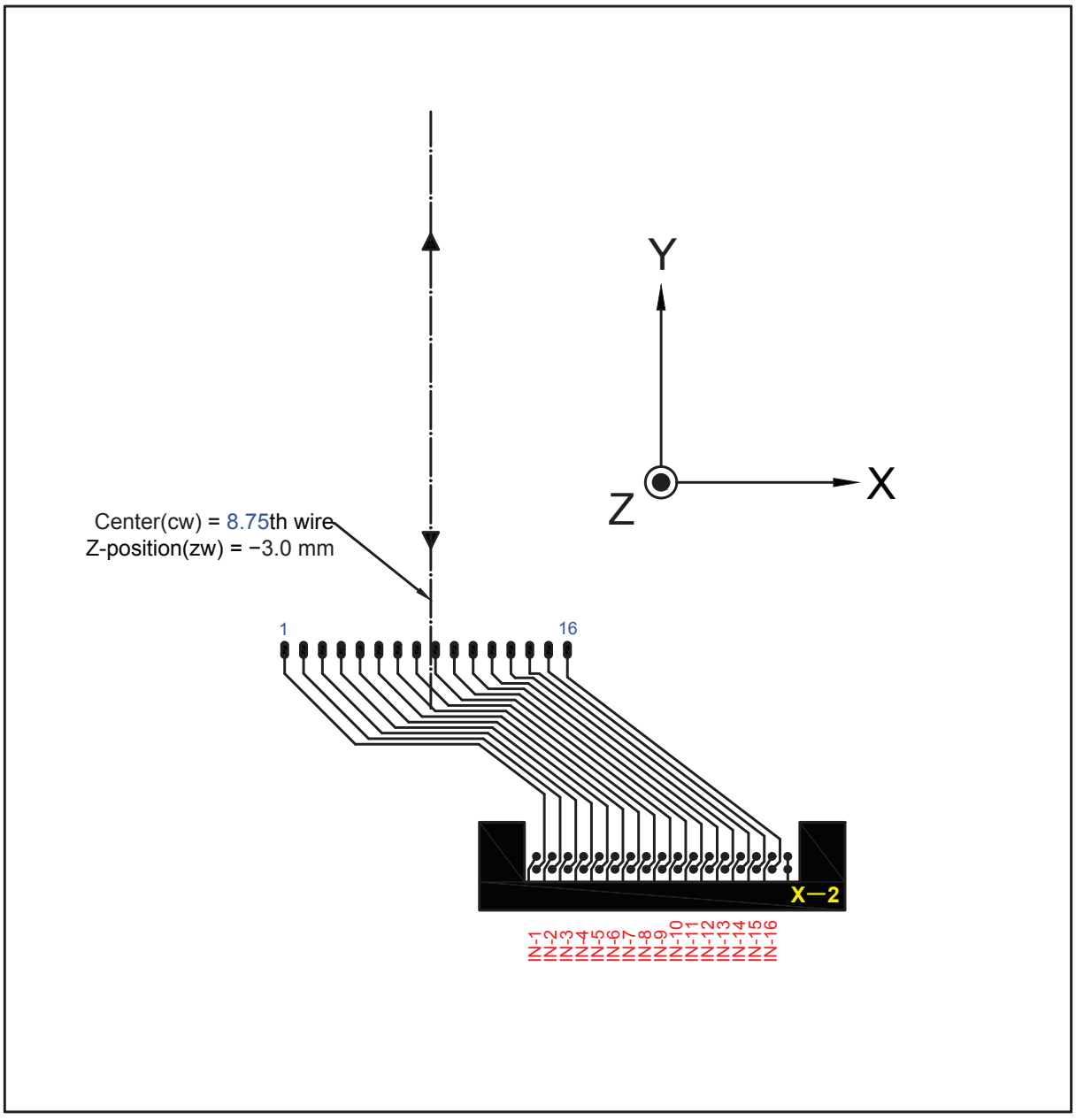


Figure 4: Wire configuration for the X2 plane.

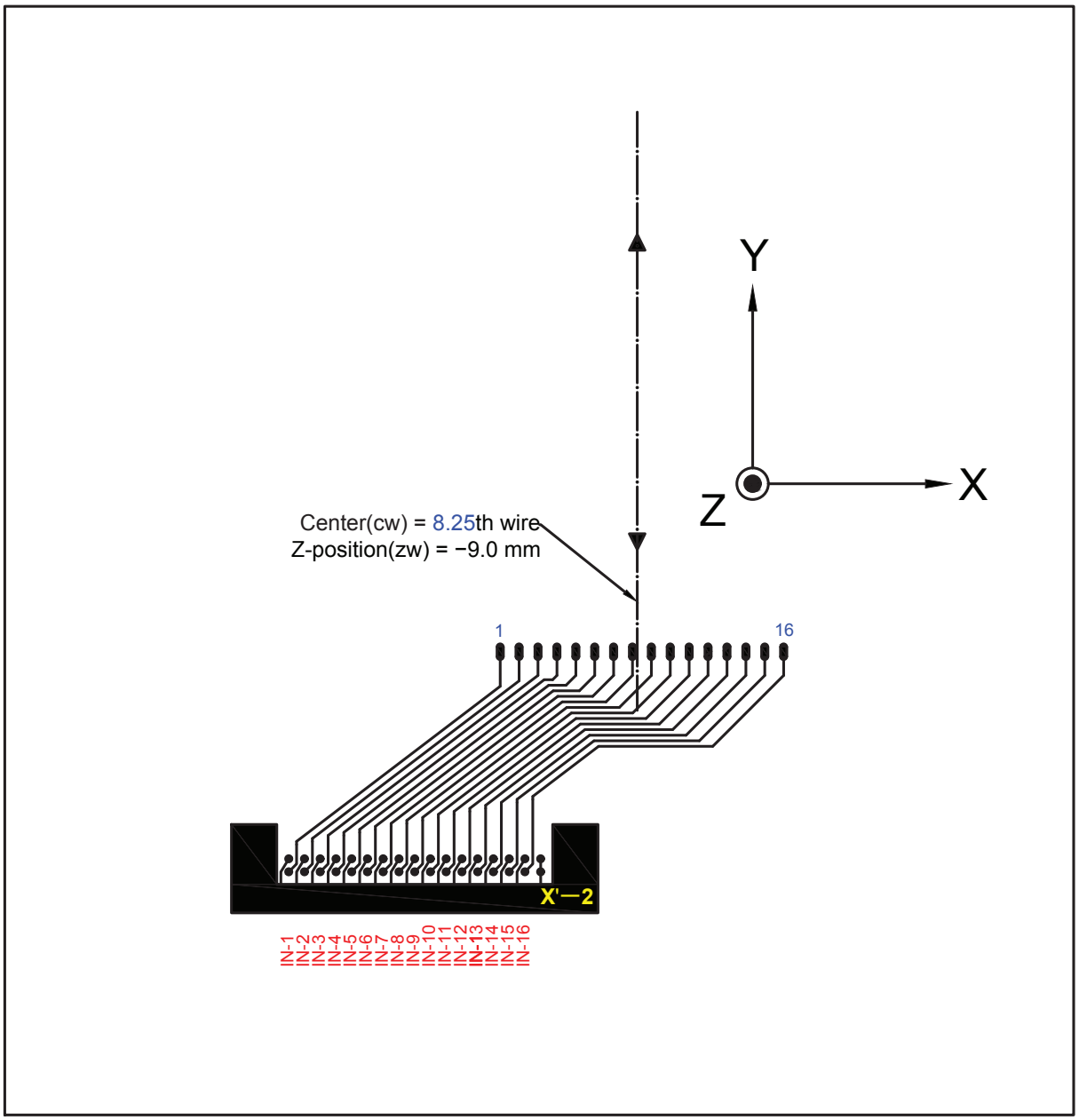


Figure 5: Wire configuration for the X'2 plane.

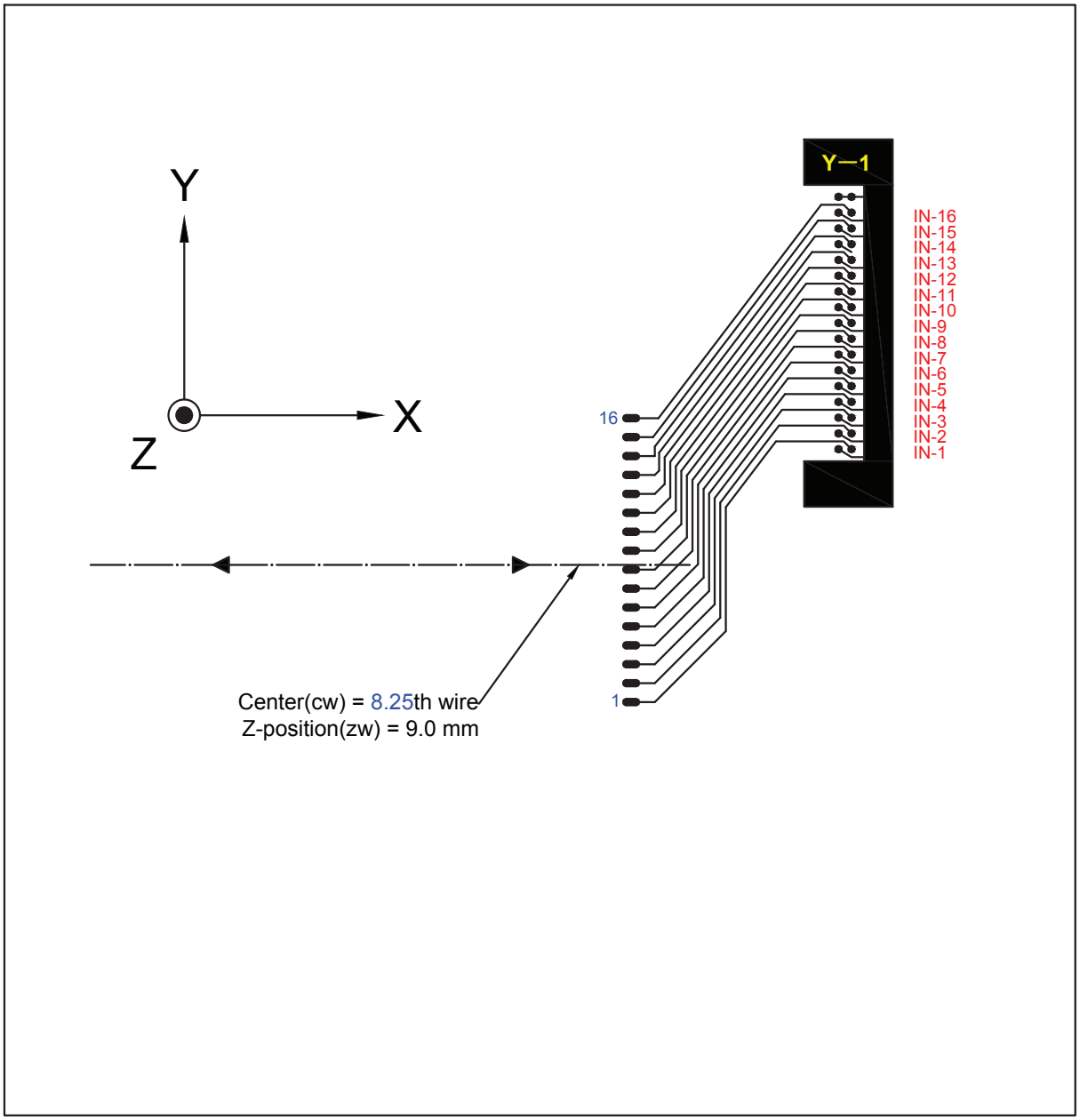


Figure 6: Wire configuration for the Y1 plane.

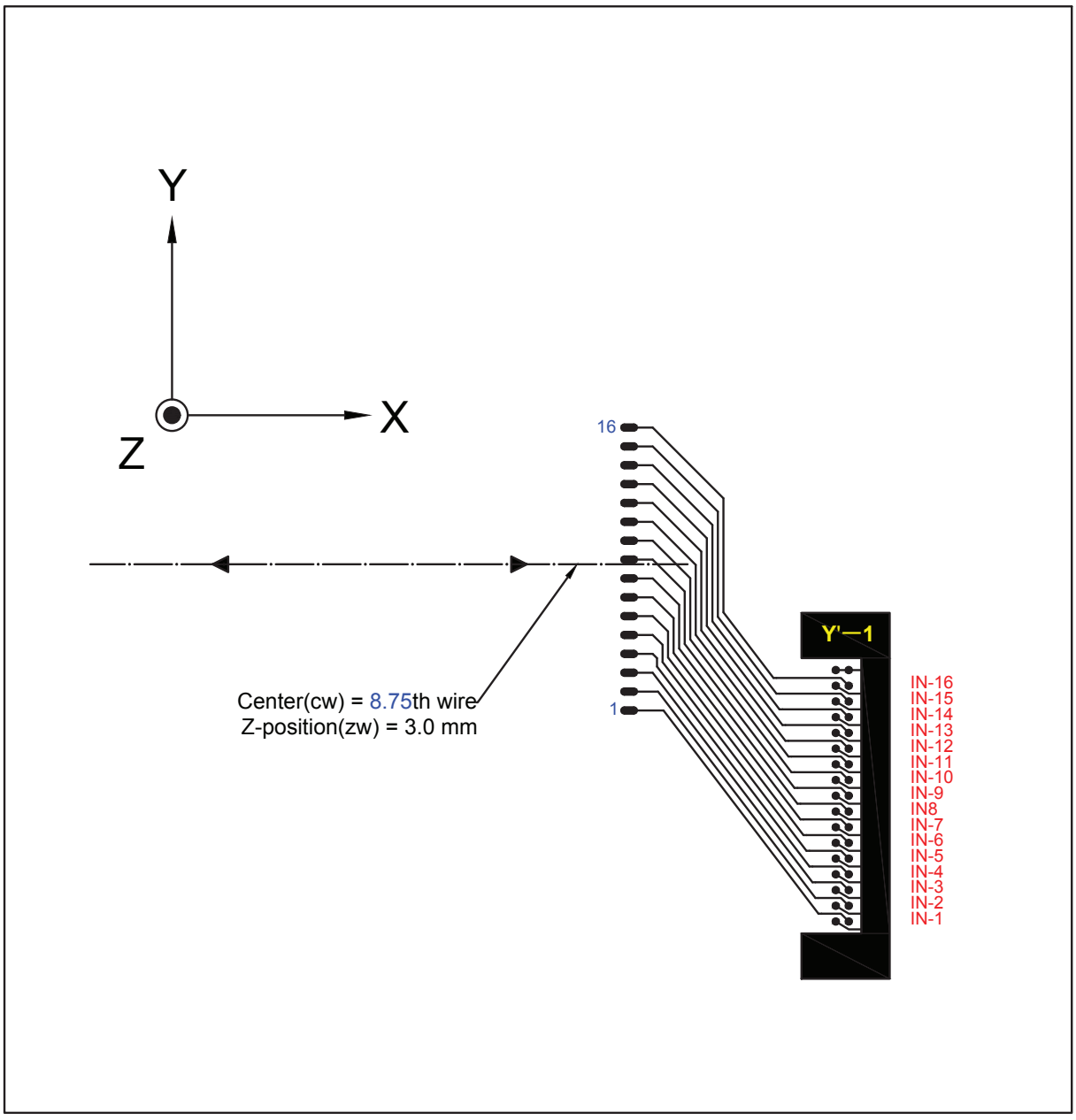


Figure 7: Wire configuration for the Y'1 plane.

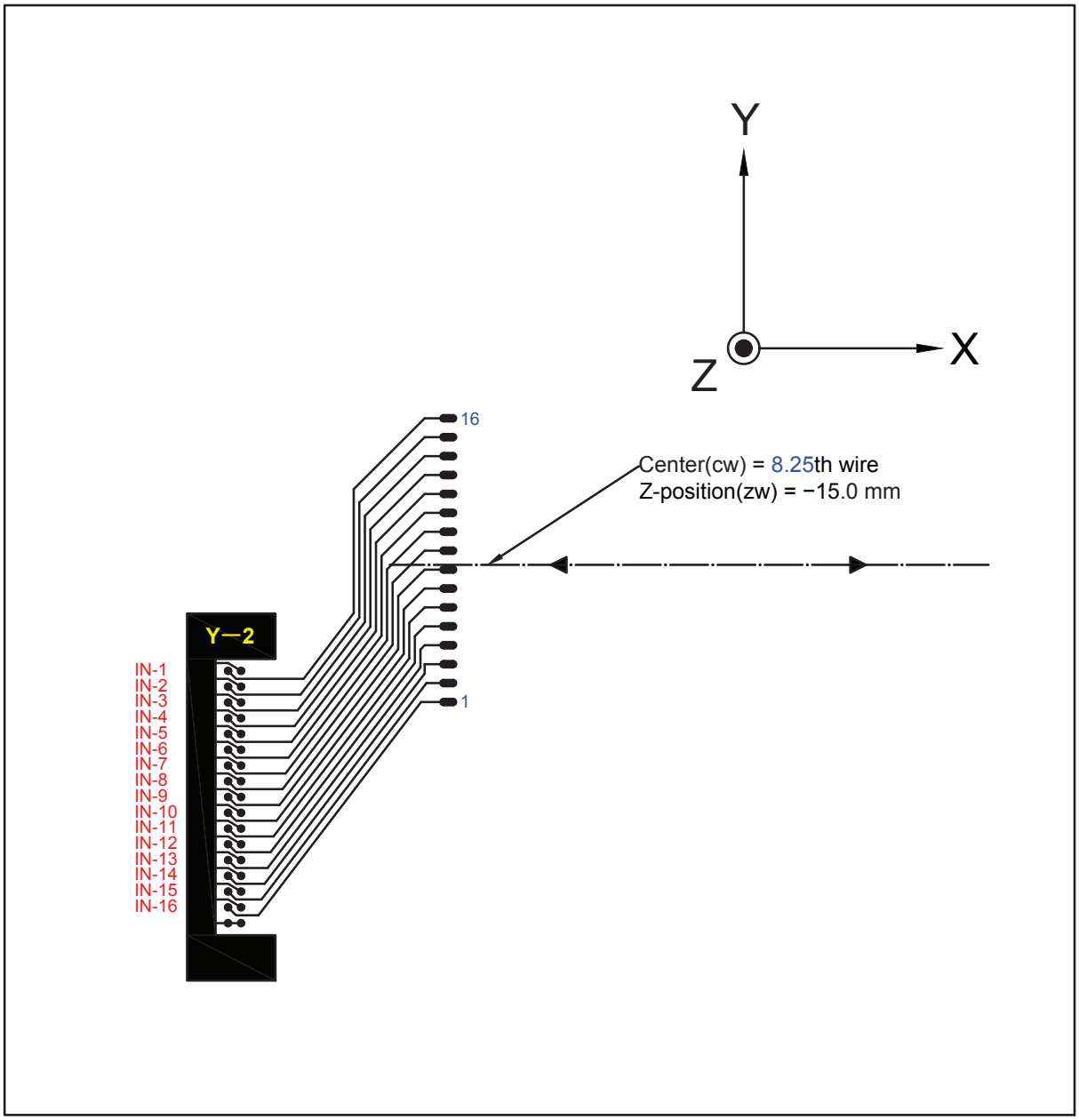


Figure 8: Wire configuration for the Y2 plane.

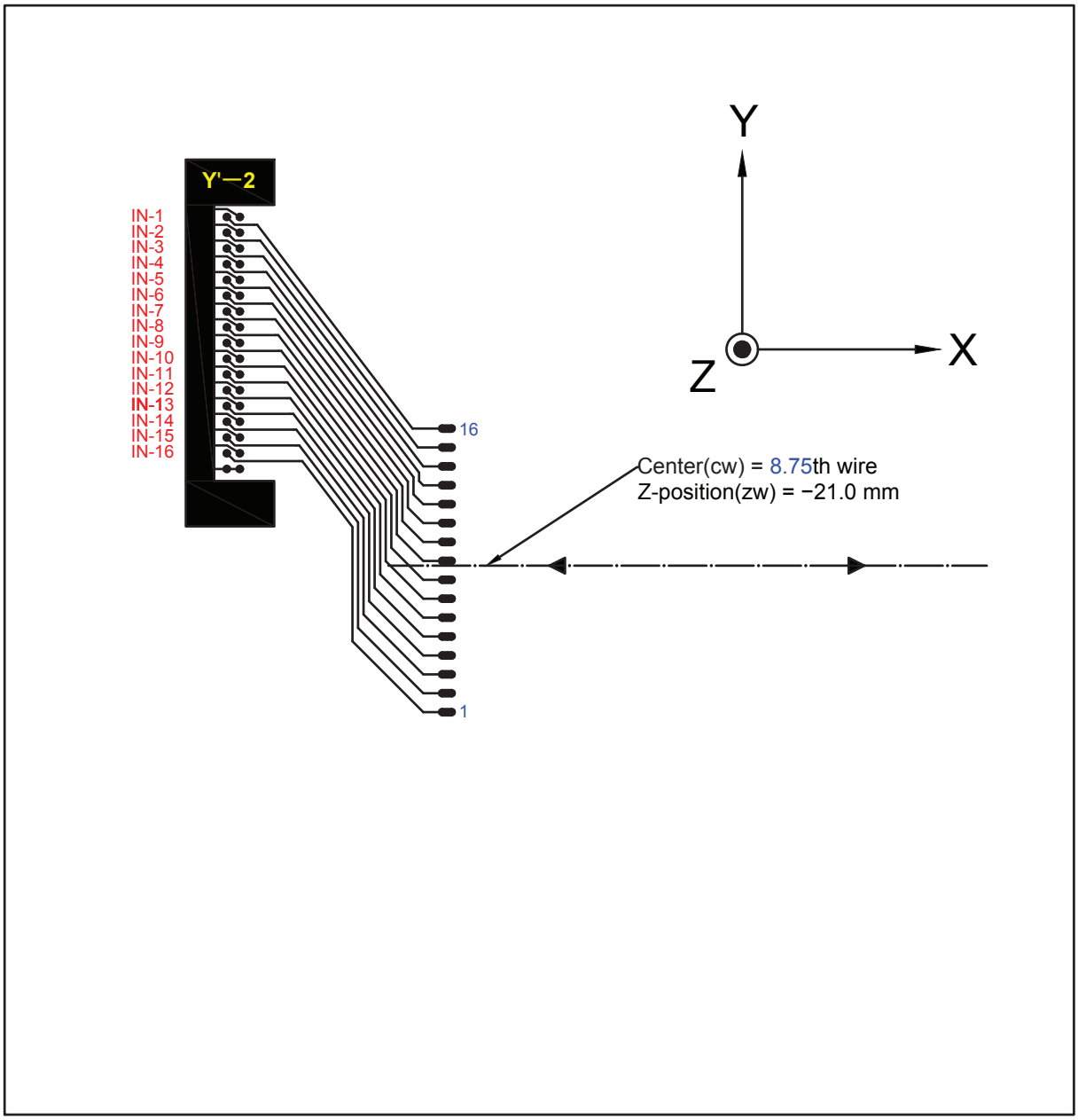


Figure 9: Wire configuration for the Y'2 plane.

Table 2: Correspondence between the wire number (W#) and the signal input/output channel number of the ASD card (ASD ch) for the X sense planes.

| X1-plane | | X'1-plane | | X2-plane | | X'2-plane | |
|---|---|---|---|---|---|---|---|
| W# | ASD ch | W# | ASD ch | W# | ASD ch | W# | ASD ch |
| 1 | IN/OUT-16 | 1 | IN/OUT-16 | 1 | IN/OUT-1 | 1 | IN/OUT-1 |
| 2 | IN/OUT-15 | 2 | IN/OUT-15 | 2 | IN/OUT-2 | 2 | IN/OUT-2 |
| 3 | IN/OUT-14 | 3 | IN/OUT-14 | 3 | IN/OUT-3 | 3 | IN/OUT-3 |
| 4 | IN/OUT-13 | 4 | IN/OUT-13 | 4 | IN/OUT-4 | 4 | IN/OUT-4 |
| : | : | : | : | : | : | : | : |
| 16 | IN/OUT-1 | 16 | IN/OUT-1 | 16 | IN/OUT-16 | 16 | IN/OUT-16 |

Table 3: Correspondence between the wire number (W#) and the signal input/output channel number of the ASD card (ASD ch) for the Y sense planes.

| Y1-plane | | Y'1-plane | | Y2-plane | | Y'2-plane | |
|---|---|---|---|---|---|---|---|
| W# | ASD ch | W# | ASD ch | W# | ASD ch | W# | ASD ch |
| 1 | IN/OUT-1 | 1 | IN/OUT-1 | 1 | IN/OUT-16 | 1 | IN/OUT-16 |
| 2 | IN/OUT-2 | 2 | IN/OUT-2 | 2 | IN/OUT-15 | 2 | IN/OUT-15 |
| 3 | IN/OUT-3 | 3 | IN/OUT-3 | 3 | IN/OUT-14 | 3 | IN/OUT-14 |
| 4 | IN/OUT-4 | 4 | IN/OUT-4 | 4 | IN/OUT-13 | 4 | IN/OUT-13 |
| : | : | : | : | : | : | : | : |
| 16 | IN/OUT-16 | 16 | IN/OUT-16 | 16 | IN/OUT-1 | 16 | IN/OUT-1 |