Optical Axis Offset: The theory and practical ways to compensate

1) General.

Front night vision (NV) attachments with an objective lens axis located above the day scope’s axis, will bring the Point of Impact (POI) lower by the amount its optical axis is offset against the optical axis of the day scope it is attached to. It is inherent in all front-mounted NV attachments with a ‘double decker’/raised architecture.

![Figure 1. General explanation of POI offset for front NV attachments with a ‘double decker’/raised design](image1)

2) Recommendation for Pulsar Forward DFA-75 users.

The DFA-75’s electronics can take in to account the POI offset and offers several ways to deal with it. The end user has 3 options to choose from, depending on their shooting technique and hunting scenario.

   a) **Factory setting.** By default the factory setting is arranged to have **no** POI shift at a distance of 100m (NPOISD = 100m). This setting is recommended if your average shooting distance is 100m.

![Figure 2 Factory setting](image2)

As per Figure 2, there is no need to make any compensation if your target is located at 100 meters. However if your target is located at 50 meters, then POI will be 2.15cm lower, at 150 meters it will be 2.15cm higher and at 200 meters it will be 4.3cm higher. The weapon operator needs to compensate for this by using their preferred method of either adjusting the elevation turret or by holding the crosshair over or under by the correct offset amount.

   b) **Resetting NPOISD distance.** If the operator wants to change the distance at which the DFA75 has no POI shift, then it can be done through the DFA-75 menu settings. Please refer to the User Manual Paragraph 9 (CHECK AND ADJUSTMENT OF THE AIMING POINT). Basically, any NPOISD can be chosen, depending on the individual requirement. Figure 3 shows a diagram where NPOISD is set at 50m.
Figure 3 Custom setting, NPOISD set at 50 meters

As per the diagram, there is no POI shift at 50 meters, bringing POI 2.15 cm lower at 25m & 2.15 cm higher at 75m.

c) **Setting ‘Parallel Line’ mode (PL).** PL mode allows setting of the DFA-75 with the same 4.3 cm POI shift at all distances. In many cases, it could be easier to hold over 4.3 cm for all distances, rather than applying the calculations explained in paragraphs a) and b). To set up PL mode, the factory setting NPOISD of 100 m needs to be overridden. To do this, set up a target, for example, at 20 m. Mark a point on the target 4.3 cm below its centre (on Figure 4 this is shown in green). Fix the day scope such that it is aiming at the centre of the target. Attach the DFA-75 to the day scope and applying the technique explained in Paragraph 9 of the User Manual (CHECK AND ADJUSTMENT OF THE AIMING POINT), adjust the setting such that POI with the DFA-75 attached will be 4.3 cm lower than the bullseye of the target (i.e. aiming at the dot shown in green on Figure 4).

Figure 4 Setting up PL mode

Figure 5 shows that the POI for all distances in PL mode will be the same.

Figure 5 Diagram illustrating the PL mode