Assume two trackers A and B in different spaces (i.e. different reference frames) have a set of paired observations with a constant relative transform between them: positions $\{\vec{p}_{A0}, \vec{p}_{A1}, ..., \vec{p}_{AN}\}$ and $\{\vec{p}_{B0}, \vec{p}_{B1}, ..., \vec{p}_{BN}\}$ with orientations $\{Q_{A0}, Q_{A1}, ..., Q_{AN}\}$ and $\{Q_{B0}, Q_{B1}, ..., Q_{BN}\}$ (where Q's are rotation matrices).

Let F be the constant transform from B's reference frame to A's and P be the constant transform from B's position and orientation to A's. For shorthand let F_r and P_r be the 3x3 rotation submatrices of F and P.

Then:

$$\forall i : \vec{p}_{Ai} = PF\vec{p}_{Bi} \tag{1}$$

$$\forall i : Q_{Ai} = P_r F_r Q_{Bi} \tag{2}$$

Trying to solve (1) on its own is not possible since there is ambiguity between P and F. Solving (1) and (2) simultaneously might be possible, but the expansion gets very tedious and I don't know enough linear algebra to know of an easy linear least squares type of solution.

We can keep going though and come up with some other properties.

$$\forall i, j : Q_{A_i}^T(\vec{p}_{Ai} - F\vec{p}_{Bi}) = Q_{A_j}^T(\vec{p}_{Aj} - F\vec{p}_{Bj}) \tag{3}$$

$$\forall i, j : |\vec{p}_{Ai} - F\vec{p}_{Bi}| = |\vec{p}_{Aj} - F\vec{p}_{Bj}| \tag{4}$$

(3) states the difference in position for a pair of samples is constant after compensating for rotation. (4) states the distance between the trackers is constant. With these we remove the need to solve for F and P simultaneously. It's tempting to try solving (4) but this ends up in quadratic land if done directly. Maybe you know a good way. If we try to solve (3) we get:

$$\forall i, j : Q_{A_i}^T\vec{p}_{Ai} - Q_{A_j}^T\vec{p}_{Aj} = Q_{A_i}^T F\vec{p}_{Bi} - Q_{A_j}^T F\vec{p}_{Bj} \tag{5}$$

In (5) the left side is known but I still don't know how to solve for F since the relative positions are dependent on the rotation. Next, let's try to look for some rotation properties since it doesn't depend on position.

$$\forall i, j : Q_{Ai} Q_{A_j}^T = F_r Q_{Bi} Q_{B_j}^T \tag{6}$$

Now this looks solvable! The idea is that the change in rotation between pairs of samples should be the same for both trackers. Some sort of SVD-based least squares solution should work. If you take the axis of rotation of $Q_{Ai} Q_{A_j}^T$ and $Q_{Bi} Q_{B_j}^T$ you can produce pairs of vectors as inputs to the Kabsch algorithm to produce the rotation matrix F_r.

Once we have F_r and apply it to the calibration points, (4) becomes much easier to solve. With $\vec{F_p}$ representing the translation of F:

$$\forall i, j : Q_{A_i}^T (\vec{p}_{Ai} - \vec{p}_{Bi} - \vec{F_p}) = Q_{A_j}^T (\vec{p}_{Aj} - \vec{p}_{Bj} - \vec{F_p}) \tag{7}$$

$$\forall i, j : (Q_{A_j}^T - Q_{A_i}^T) \vec{F_p} = Q_{A_j}^T (\vec{p}_{Aj} - \vec{p}_{Bj}) - Q_{A_i}^T (\vec{p}_{Ai} - \vec{p}_{Bi}) \tag{8}$$

(8) is a linear equation, solvable with standard methods.