We show the NP-hardness by reduction from VertexCover.

Given any instance of VertexCover, $G = (V, E)$ and k, we construct an instance of SteinerTree, $G' = (V', E')$, T, and k' as follows. For any $v_i \in V$, there is a vertex $v' \in V'$. Moreover, for any edge (v_i, v_j), there is a vertex $v'_{i,j} \in V'$. Finally, there is a dummy vertex $d \in V'$. The set of terminals T consists every $v'_{i,j}$.

Now we construct the edges in G'. For any $v'_{i,j}$, there is an edge $(v'_i, v'_{i,j}) \in E'$ and an edge $(v'_j, v'_{i,j}) \in E'$. Finally, for any $v'_i \in V'$, there is an edge $(v'_i, d) \in E'$.

In the end, we let $k' = |E| + k$. The construction takes polynomial time.