The dichotomy between detail representation and data management is still a big issue in the context of the acquisition and visualization of 3D objects, especially in the field of Cultural Heritage. New technologies give the possibility to acquire very detailed geometry, but very often it’s very hard to process the amount of data produced. In this paper we present a project which aimed at virtually reconstructing the impressive (7x11 m.) portal of the Ripoll Monastery, Spain. The monument was acquired using triangulation laser scanning technology, producing a dataset of more than 2000 range maps for a total of more than 1 billion triangles. All the steps of the entire project are described, from the acquisition planning to the final setup for the dissemination to the public. In particular, we show how time-of-flight laser scanning data can be used to obtain a speed up in the alignment process, and how, after model creation and imperfections repairing, an interactive and immersive setup gives the public the possibility to navigate and visualize the high detail representation of the portal. This paper shows that, after careful planning and with the aim of new algorithms, it’s now possible to preserve and visualize the highly detailed information provided by triangulation laser scanning also for very large surfaces.