The Logistic-Gaussian distribution is used in statistical applications to account for clustering among binary outcomes. However, its extension and applicability to bivariate outcomes are limited. We developed a model for correlated bivariate binary data that incorporated the Logistic-Gaussian distribution. Bivariate response probabilities in terms of random effects models are formulated, and maximum marginal likelihood estimation procedures based on Gauss-Hermite quadrature. Application to the analysis of vision loss in diabetic retinopathy are is discussed. keywords: Correlated Data; Logistic -Gaussian Distribution; Maximum Marginal Likelihood; Bivariate Binary Outcomes; Gauss-Hermite quadrature; Simulation. (Received September 08, 2017)