$$n_+ = Number\ of\ Particles\ with\ Spin + \frac{1}{2}$$

$$p_+ = Probability\ that\ Particle\ has + \frac{1}{2} spin$$

$$n_- = Number\ of\ Particles\ with\ Spin - \frac{1}{2}$$

$$p_- = Probability\ that\ Particle\ has - \frac{1}{2} spin$$

$$Total\ Spin = n_+ \frac{1}{2} - n_- \frac{1}{2}$$

$$N = n_+ + n_-$$

$$n_- = N - n_+$$

$$Total\ Spin = n_+ \frac{1}{2} - (N - n_+)\frac{1}{2} = \frac{1}{2}(2n_+ - N)$$

Total magnetic Moment is m therefore (not sure how total spin relates to total magnetic moment)

$$\frac{1}{2}(2n_+ - N) = m$$

$$n_+ = \frac{2m + N}{2}$$

$$Probability\ that\ we\ have\ n_+\ particles\ with\ spin\ \frac{1}{2}\ and\ n_- particles\ with\ spin - \frac{1}{2}$$

$$= \frac{N!}{n_+! n_-!} p_+^{n_+} p_-^{n_-}$$

Using the formula

$$n_+ = \frac{2m + N}{2}$$

$$Probability\ that\ magnetic\ moment\ is\ m = Probability\ that\ n_+ = \frac{2m + N}{2}, therefore:$$

$$Probability\ that\ magnetic\ moment\ is\ m = \frac{N!}{\left(\frac{2m + N}{2}\right)! \left(N - \frac{2m + N}{2}\right)!} p_+^{\frac{2m+N}{2}} p_-^{N - \frac{2m+N}{2}}$$