what is the equation for magnetic induction?

The most widespread version of Faraday's law states:

The induced electromotive force in any closed circuit is equal to the negative of the time rate of change of the magnetic flux through the circuit:

$$\mathcal{E} = -\frac{d\Phi_B}{dt}$$

where $\mathcal{E}$ is electromotive force acting along an arbitrarily chosen path,

$$\Phi_B = \iint_S \vec{B} \cdot d\vec{S},$$

-- magnetic flux through the surface stretched on this path.

For example, for a tightly wound coil of wire, composed of *N* identical loops, each with the same Φ_B, Faraday's law of induction states that

$$\mathcal{E} = -N\frac{d\Phi_B}{dt} = -\frac{d\Psi}{dt}$$

where *N* is the number of turns of wire, Φ_B is the magnetic flux in webers through a single loop and Ψ is the flux linkage of a coil.