

GR4 model parameter	Theoretical transformation from the daily ( $\Delta t_d$ ) to the hourly ( $\Delta t_h$ ) time step	Source of time step dependency
$\nu$	$\nu_{\Delta t_h} = \nu_{\Delta t_d} \left( \frac{\Delta t_d}{\Delta t_h} \right)^{\frac{1}{4}}$	Integration of the percolation power 5 function from the production store
$x_1$	$x_1(\Delta t_h) = x_1(\Delta t_d)$	–
$x_2$	$x_2(\Delta t_h) = x_2(\Delta t_d) \left( \frac{\Delta t_d}{\Delta t_h} \right)^{-\frac{1}{8}}$	Integration of the exchange flux formulation (dependent on the routing store level)
$x_3$	$x_3(\Delta t_h) = x_3(\Delta t_d) \left( \frac{\Delta t_d}{\Delta t_h} \right)^{\frac{1}{4}}$	Integration of the fuelling power 5 function of the routing store
$x_4$	$x_4(\Delta t_h) = x_4(\Delta t_d) \left( \frac{\Delta t_d}{\Delta t_h} \right)$	Discrete concentration time in time step units of the unit hydrographs