The possibility of using terrestrial television broadcast signals (STVB) as sounding signals for mesosphere/lower thermosphere (MLT) wind measurements by the radio meteor method is investigated for the first time. Use of STVB allows to use external transmitters and consequently to reduce costs of such measurements. Using a specially developed receiver und digital signal processing tool, observations of the reflected from meteor trails STVB (transmitter Kyiv, carrier frequency 59.25 MHz, SECAM colour television system) and their Doppler carrier frequency shift (dF) have been obtained in April 2010 at Kharkiv (50°01'N 36°14'E), Ukraine. We show that mean hourly dF (dFh) has diurnal and semidiurnal components typical for MLT winds. Validation of the obtained results has been performed using TIMED/TIDI satellite wind profiles for Kharkiv for the time of the radio measurements. TIDI mean winds are correlated with dFh with a correlation coefficient of 0.58. The obtained measurements show that dFh is proportional to the MLT wind, the STVB can be used for the MLT wind measurements by the radio meteor method and that the developed technique can be used for MLT wind monitoring on the base of the existing terrestrial television broadcasting network.