The invention relates to a system, an ultrasound probe and a corresponding method for measuring arterial parameters using non-imaging ultrasound. The system comprises an acquisition unit for acquiring doppler ultrasound signal from a blood vessel and a processing unit for processing the acquired doppler ultrasound signal and to determine the changes in the blood vessel through the measurements of at least Peak Systolic Velocity (PSV) and Pulse Wave Velocity (PWV). The acquisition unit comprises an ultrasound probe having a plurality of transducer elements arranged in a grid configuration, and comprising a first probe (102a) and a second probe (102b) detachably connected to each other. In the split configuration the ultrasound probe is provided to measure the PWV globally between the carotid and femoral arteries, or the PSV and PWV locally and simultaneously. In the integrated configuration the PSV or PWV may be measured locally.
Designated States (unless otherwise indicated, for every kind of regional protection available):

- Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM)
- European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR, OAPI (BF, BI, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG)

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