IMPULSE METER OF RESISTANCE
type IMR-4

The impulse meter of resistance IMR-4 is a portable device to take earth electrode resistance measurements in the vicinity of DC railway traction systems. Particularly for measurements of earthing systems of substations, sectioning cabins, open group bonding systems, support structures, bridges, viaducts etc. The railway or tram tracks, being a part of return circuit, are used for the measurement as a current probe with known resistance (0,1 ÷ 0,2Ω). In the simplest method no voltage probe is required. If resistance of current probe isn't known, traditional Kelvin method with voltage probe could be applied.

Basic technical parameters:

Measurement range	0,05 ÷ 999 Ω
Measurement accuracy R < 100 Ω	2,5 % lub 0,02 Ω
Measurement accuracy R ≥ 100 Ω	10 %
Impulse voltage level	100 V
Power supply	battery 12 V / 2.2 Ah
Number of tests (without battery charging)	> 50
Overall dimensions (suitcase form)	340 x 290 x 130
Weight	5 kg

Accessories:
- Battery charger
- Spare fuses

The meter can be used for the measurement of small resistances including:
- continuity of return and working conductors of cables with indication of measured resistance,
- continuity and quality of connections in bonding and earthing systems,
- resistance of any short-circuit loop.


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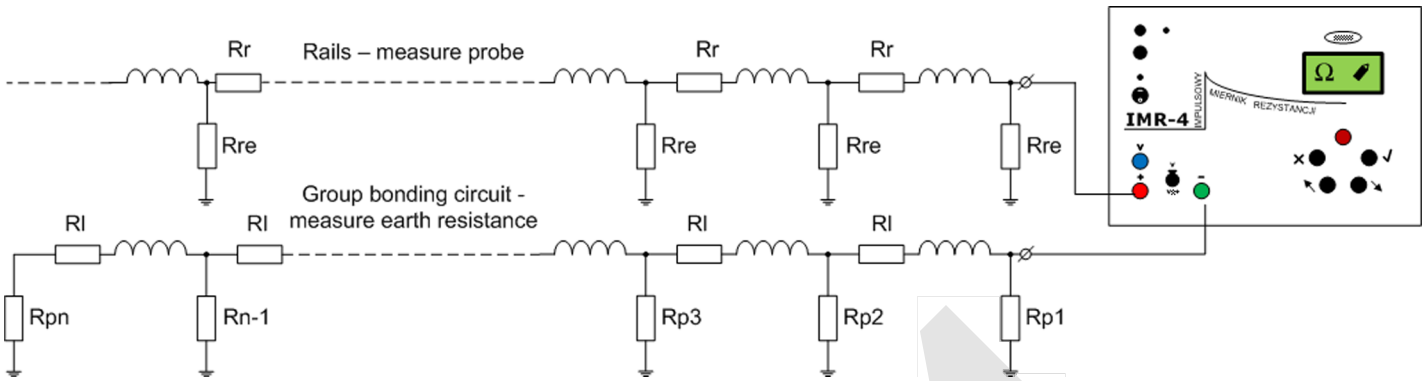


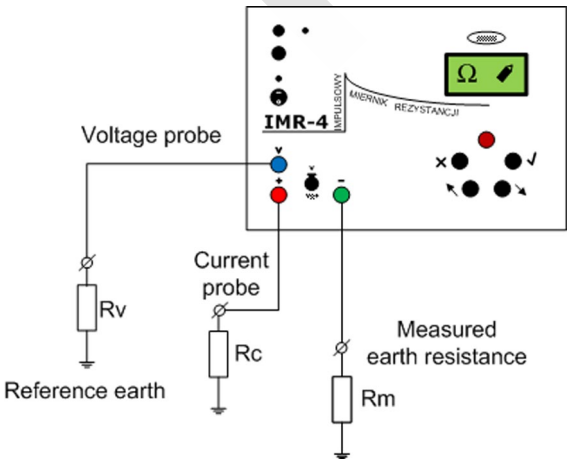
To take measurement the meter shall be connected between measured earth electrode and railway (tram) tracks or other earth electrode which resistance is known (i.e. earth electrode of HV/MV power station – 0,2÷0,5 Ω). During measurement the meter outputs single current impulse - up to 100 A and several dozens milliseconds duration. Measuring current depends on the resistance; reaches 100 A maximum and goes law when the output resistances are higher. Single measure impulse does not interfere with other track circuits and devices.

The resistance is calculated on the base of registered current and voltage graphs. The computational method eliminates influences (existing in the measuring circuit) of induction, DC and AC/50 Hz and its harmonics. Measured values are stored (together with a date) and then can be transmitted to the computer (to detailed analysis if it possible).

The resistance of measured earth electrode is lower than displayed value on a meter because of the rail to earth passage resistance - 0,1÷0,2 Ω (higher values refer to the tracks in proper technical condition and with group bonding system) or other known resistance value of the used current probe and resistance of used measure cables.

In the case of the lack of current probe which resistance value is known, the IMR-4 can also be used as in traditional technical method with the use of any current and voltage probes. The measurement accuracy in this case depends on the voltage probe location, which potential should be the same as a reference earth.

The impulse measurement method creates conditions to be found during real short-circuits.



The resistance measurement of earth electrode with the use of IMR-4 meter is equivalent to the technical method. Any additional probes are not required; the access to tracks or an other current probe, which resistance is known, and tested earth electrode is sufficient. The measurement with the use of railway or tram tracks can be performed without deenergizing of OCL. The impulse current can reach up to 100 A for resistances close to 0.1 Ω and reduces to 10 A for resistances close to 10 Ω. Measured values are stored (together with a date) and then can be transmitted to the computer (for further analysis or to be saved). Inner battery can performed several dozens of tests without charging.

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