

## Fast Transient Immunity Testing Group3 DTM-151 to IEC1000-4-4

A Group3 digital teslameter, model DTM-151, was tested to IEC1000-4-4, level 3, and passed to performance criterion B. An explanation of the test follows:-

### General:

The IEC1000-4-4 electrical fast transient test consists of coupling fast transients into a device under test through its power input and I/O leads. The coupling mechanism is a set of 1 metre long metal plates, with the lead of interest clamped between them. A burst of fast transient spikes is applied across the plates. The waveform of the individual spikes is 5ns rise time, 50ns duration, and the repetition rate of the spikes is 2.5KHz. A burst of this waveform is applied for 30ms, then a rest time of 300ms, before repeating the burst, for a total test time of 1 minute minimum.

The test is then repeated using spikes of the opposite polarity. This procedure is repeated for each I/O wire and DC power lead of the device.

IEC1000-4-4 specifies several levels of test severity - level 3 corresponds to a typical industrial environment, and uses 2kV spikes. There are several performance criteria that can be applied; Performance Criterion B is the usual one stipulated by many international tests. It states that the apparatus should continue to operate as intended after the test, but that some temporary loss of performance is permissible during the test.

### DTM test setup:

A DTM-151-Ds (Digital Teslameter with Display and Serial Communications) was used with an MPT-141-2S probe (Miniature, temperature corrected, on a 2m long shielded cable).

The Teslameter display was visible, and the serial data was accessed via 5m fibre optic cables, then converted to RS-232 using a Group3 FTR, and displayed on a monitor screen. The teslameter was set to transmit field readings to the monitor at the maximum rate of 10 per second. A small permanent magnet was placed near the probe head to give a constant field reading. As is specified for use in a high noise environment, the probe cable had a split core ferrite clamped over it as it entered the connector case. The power to the teslameter was supplied from a 12V DC isolating switching supply (Group3 model no. PS12D7), via two metre long twin core flex, wound four times through a ferrite tube, as specified by Group3 for high noise environments.

### The tests:

Power supply lead: The DC lead was clamped in the coupling device, and bursts of spikes of either polarity applied to the plates.

Probe: The same procedure was followed, clamping the probe cable in the coupling device.

### The results:

The DTM-151 passed the tests to IEC1000-4-4, level 3, at performance criterion B.