Discontinuous Interference Analyser

DIA 1512D

- **Fully meets EN55014-1 and CISPR 16-1**
- **New Windows 'Clickware' software**
- **Modular system under software control**
- **Waveform display**
- **CISPR 14 2000 Compliant**

Introduction

Household products, power tools and other appliances, even if they do not produce continuous interference, need to be measured for discontinuous interference in the frequency range of 150kHz to 30MHz. Because the interference generated by such products is aperiodic, the limits are relaxed from those products that emit continuous interference. Hence manufacturers must measure the amplitude, duration and repetition rate of emission from their products to determine whether the interference is discontinuous, referred to as a 'click', or continuous and then apply the correct limits.

Such a process is complex, difficult and prone to errors. Schaffner EMC Systems were part of the original CISPR working group and were involved in the development of the world's first dedicated Discontinuous Interference Analyser in 1972. Continued development led to the introduction of the fully automatic DIA 1512. Building on the previous DIA 1512A and B models used by hundreds of household appliance manufacturers and test laboratories around the world, the new DIA 1512D Discontinuous Interference Analyser adds a new dimension to measurement accuracy, user information and flexibility together with comprehensive click analysis software.

The DIA 1512D is a multi-channel discontinuous interference analyser conforming to the requirements set down in CISPR Publication 16-1, for measurements to CISPR14 (EN55014-1).

The analyser can have up to six channels for performing interference analysis at different frequencies. These channels may be used either with internal fixed frequency CISPR receivers or with tuneable external receivers with a suitable IF (Intermediate Frequency) output. As each channel operates independently of the others, the analyser may be used to perform simultaneous observations on different frequencies, reducing total testing time dramatically.

The analyser can be used without any other receivers, reducing the amount of measuring equipment required for discontinuous interference measurements.

The large amount of information collected by the DIA 1512D during measurement is displayed via a PC running Windows 95/98. This displays the short clicks, long clicks and continuous interference for each channel, together with test duration and number of switching operations.

The analyser is microprocessor controlled. The automatic setting techniques eliminate the need for manual setting of duration and amplitude channel reference levels. As each receiver module has its own independent input attenuator, measurements can be made without the risk of input saturation or under-ranging, even if the signals are at very different levels in each channel.

Internal Receivers

Each comprises a fixed frequency CISPR 16-1 Band B receiver, complete with attenuators.

External tuneable measuring receivers with 455kHz, 10.7MHz or 21.4MHz IF output can also be used. The IF output of the receiver is connected to the input of an internal receiver, with the CISPR detector function and characteristics provided by the DIA 1512D internal receiver
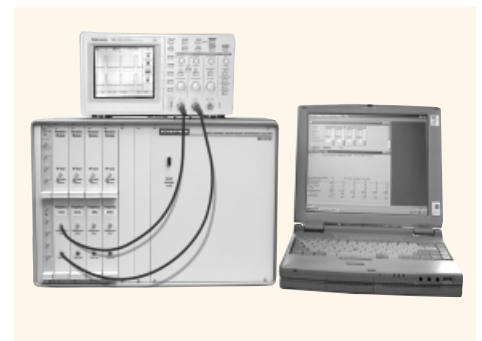
Discontinuous Interference Analyser | DIA 1512D

Technical Description

The DIA 1512D comprises a mainframe and up to six plug-in, fixed frequency receivers which all conform to CISPR 16-1. The DIA can make simultaneous measurements of click rate, short clicks, long clicks, 2 clicks in 2 seconds, switching operations and apply the upper quartile criteria to determine appliance pass and fail data. Alternatively, the user can have one receiver at a common IF frequency which is then fed from an external receiver. The mainframe has a built-in RS232 interface which is connected to an external PC running the Windows 'Clickware' program which controls the instrument, stores the data and provides a full test report.

Waveform Analysis

The DIA is also available with optional waveform analysis via an external digital oscilloscope, clicks on one to four channels can be displayed. Post-test click timings are also available via the clickware software.

Measurement Sequence

Whilst the system is fully flexible and allows special conditions, for example refrigerators where the click rate N=half the number of switching operations, the user has available a standard method of generating an EN55014-1 compliant measurement sequence.

This is as follows;

- Runs for 120 mins or until 40 clicks have been registered
- Calculates click rate N from No. of clicks/time in minutes
- Runs test again, using the click rate information.
- Calculates Lq from $20\log 30/N + L$
- Registers where N>30 or where 2 clicks occur in 2 seconds. Applies L or Lq as necessary
- Registers instantaneous switching (short clicks <10ms), applies limits/exempt criteria
- Registers continuous interference
- Registers 20ms clicks and 90% less than 10ms
- Applies Upper Quartile Method where appropriate or L=Lq+44dB
- Give Pass/Fail Information
- Generates Test Report including table of each click measured, timing information and amplitude information, limits, etc.
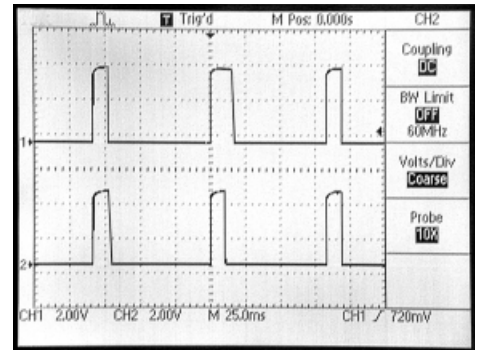
Standard Frequencies	Product Code
* 150kHz	DIR 1550
160kHz	DIR 1551
* 500kHz	DIR 1558
550kHz	DIR 1552
1MHz	DIR 1553
* 1.4MHz	DIR 1554
3.5MHz	DIR 1555
10MHz	DIR 1556
455kHz	DIR 1559
10.7MHz	DIR 1561
21.4MHz	DIR 1562
* 30MHz	DIR 1557

Note: *These are "Plug-in" modules, up to 6 may be used at the same time.*

* Test Frequency suggested by CISPR14 (other frequencies to special order)

UKAS Calibration option

Technical Specifications	DIA 1512D
Sensitivity	20dBµV (45dBµV at input of splitter)
Attenuation	0-79dB variable in 1dB steps
Pulse response, bandwidths etc.	As for CISPR 16 Band B
Frequency	Fixed in the range: 150kHz - 30MHz
Frequency accuracy	±2%
Information displayed	No. of short clicks / No.of long clicks / No. of seconds of continuous interference (resolution 0.1s)
	Greater than 2 clicks in 2s indication / Duration of test (in units of 0.1 minute) / No. of switching operations, Meter Indication
Test duration	0 - 120 minutes in minute steps or continuous
	Programme controls a heavy duty contactor (15 amp)
	Manual control of contactor is also possible
Construction	Eurocard frame mounted in standard instrument case with integral power supply
Power requirements	120 / 240V, ±10%, 50Hz AC, 100Watt

Minimum Computer Configuration	
200MHz Pentium or compatible processor,	Mouse or compatible pointing device
32MB RAM / 10MB Free Hard Disk space	Serial Port, must be free for connecting to DIA 1512D
VGA Graphics	Windows 98

High current 3-phase contactor option	DIA 1530A