



## Pre-recorded DVD Master, Stamper and Disc Analysis

- Master\*, stamper and disc analysis in one module
- According to the DVD Forum specification
- Based on Pulstec DVD drive
- Multi-Dimensional calibration
- HF, jitter, mechanical and tracking parameters checked
- Radial tilt control, focus offset compensation and slicing level adjustment for jitter measurement
- Local defect detection/missing pits
- Error flag analysis (PI-errors, PI-fail, PO-fail)
- Split test with any other DaTARIUS DVD Analyzer
- Double-Check function
- Control data simulation
- DVD-9 OTP sector number check
- CSS check

\* Only in the DVD A SM1X and depending on mastering equipment



DVD A S 1X



DVD A SM 1X



DVD A S1X dual adapter

The DVD Analyzers are based on the Pulstec reference pickup and drive. The DVD Analyzer Stamper 1X (DVD A S1X) allows users to check the quality of DVD-5 and DVD-9 stampers and replicas. The DVD Analyzer Stamper Master 1X is a modified version of the DVD A S1X to additionally enable glass master measurements. The upgraded DaTARIUS drive mechanism allows this drive to handle DMS Evolution (formerly OMP) glass masters in its loader.

A main controller board supervises four micro controllers, handles communication with the CS-4/WIN main computer, and controls the test sequences. One controller analyzes servo and HF parameters and creates the HF signal snapshot and eye pattern, another controller measures jitter and creates the associated histograms, a third controller analyzes the error flags, and a fourth one is responsible for servo performance.

The DVD A S1X and DVD A SM1X are designed to fit into any CS-4/WIN Main System and can be operated with the DaTARIUS CS-4/WIN software. The Analyzer can be combined with up to 7 other Analyzers (CD and DVD Stamper and Disc Analyzers, Optical Analyzer). If applicable, all existing test modes, functions, and presentation features available for CD testing are also available for DVD testing.

Both DVD A S1X and DVD A SM1X can also be upgraded to fit into any DaTAVIEW-based system (DaTABANK or CS5) to enjoy the benefits of all DaTAVIEW features: user-friendly GUI (Quality Webs, surface presentation), remote control and statistical tools etc (please refer to DaTABANK leaflet).



# measure

| Measured parameters   |   |   | DVD A S1X | DVD A SM 1X |
|---|---|---|-----------|-------------|
| CS5/CS4™ DVD Analyzer can also measure recorded DVD±R/RW/DL |   |   |           |             |
| HF  | I14H  | reflectivity  | ✓         | ✓           |
|   | I14N  | relative peak to peak value for the longest pits/lands I14/I14H | ✓         | ✓           |
|   | I3N   | relative peak to peak value for the longest pits/lands I3/I3H   | ✓         | ✓           |
|   | RES   | Resolution I3/I14   | ✓         | ✓           |
|   | ASYd  | asymmetry   | ✓         | ✓           |
|   | TCS *   | track crossing signal   | ✓         | ✓           |
|   | I14V  | I14H variation over one revolution                              | ✓         | ✓           |
|   | IVD   | I14H variation over the disc                                    | ✓         | ✓           |
|   | IVDF  | filtered I14H variation over the disc                           | ✓         | ✓           |
|   | I14D  | I14H difference between layer 0 and layer 1                     | ✓         | ✓           |
|   | R14H  | I14H measured at radial position                                | ✓         | ✓           |
|   | HFVd  | I14 amplitude variation within one revolution                   | ✓         | ✓           |
|   | IBVd  | I14L variation within one revolution                            | ✓         | ✓           |
|   | HFL   | HF low  | ✓         | ✓           |
| DO  | HD drop-out   | ✓   | ✓         |             |
| Mechanical  | TRPd  | track pitch   | ✓         | ✓           |
|   | ATP0,1  | average track pitch measured over the whole layer               | ✓         | ✓           |
|   | SVYd  | scanning velocity   | ✓         | ✓           |
|   | BPL 0,1   | begin program layer 0,1   | ✓         | ✓           |
|   | BLO 0,1   | begin lead-out layer 0,1  | ✓         | ✓           |
|   | ECC 0,1   | eccentricity  | ✓         | -           |
|   | BLI 0,1   | begin lead-in layer 0,1   | ✓         | ✓           |
| Time-based  | ELO 0,1   | end lead-out layer 0, 1   | ✓         | ✓           |
|   | JC*   | Jitter combined   | ✓         | ✓           |
|   | JIT   | Continuously measured Jitter                                    | ✓         | ✓           |
|   | SLE   | Slicing Level   | ✓         | ✓           |
|   | TLC   | Tilt Level Compensation   | ✓         | ✓           |
| Digital   | FOF   | Focus Offset  | ✓         | ✓           |
|   | PIE   | parity inner code errors  | ✓         | ✓           |
|   | PIF   | parity inner code fails   | ✓         | ✓           |
|   | POF   | parity outer code fails (uncorrectable)                         | ✓         | ✓           |
| Servo & Tracking  | APIE  | average PIE measured over the whole disc                        | ✓         | ✓           |
|   | TPP   | tangential push pull  | ✓         | ✓           |
|   | RNSd  | radial tracking error signal                                    | ✓         | ✓           |
|   | RAD1  | radial tracking error signal                                    | ✓         | -           |
|   | FE  | Focus Error   | ✓         | -           |
|   | RPP*  | Radial Push Pull  | ✓         | ✓           |
| DPT*  | Differential phase tracking error signal                  | ✓   | ✓         |             |
| DPA*  | asymmetry of the differential phase tracking error signal | ✓   | ✓         |             |

**Double-Check:** This feature commands the analyzer (or another analyzer in split mode) to re-check, in 1X, a suspicious position.

**Split Test:** The CS-4/WIN Software can combine up to 8 analyzers to reduce measuring time. The DVD Analyzers can be combined with any DaTARIUS DVD analyzer in split test mode.

**Control Data:** In the case of SACD or copy protected discs, on which control data is scrambled or missing, control data will be simulated in order to allow normal testing sequences.

**Sector Number Check for DVD-9 OTP**  
For DVD 9 OTP, a sector number check is performed on layer 0's last sector, layer 1's first sector and lead-out's last sector, then compared with the information stored in the control data.

**CSS Check:** Performs a CSS key check to ensure that the key on layer 0 is the same as on layer 1.

**Resolution, Presentation, Procedures**  
Most of the listed parameters are measured and sampled continuously. One set of data is presented for every 512 sectors/ 32 ECC frames (corresponding to 1 MB of data, or about one data set per each 0.75 seconds, at reference play-back speed).

**Stamper Adapter - dual adapter option**  
In order to play DVD stampers, a compensation glass is required to simulate the replica's polycarbonate substrate. With the DaTARIUS DVD Analyzer dual adapter option, there are two options for playing stampers. The first option places a glass compensation layer over the whole stamper. With this option, regular replicas can also be played (using an appropriate mount). The second option utilizes a small compensation glass mounted directly onto the pickup optic. Stampers can then be played without any covering, but the glass will need to be removed before replicas can be played. (This second option is not available on the standard DVD Analyzer S1X.)

**Glass Master Adapter (DVD A SM 1X)**  
DMS Evolution glass masters have no centre hole but a small metallic ball fixed on the centre of the reverse side. A magnetic mechanism installed in the drive's turntable will lock the master via the ball. Replicas are also magnetically fixed on the turntable via a special adapter installed through their centre hole.

\* These parameters are measured in single speed on several positions, in some cases in the 'open loop' condition, where applicable. Positions can either be selected automatically (equally distributed throughout the disc), or can be specified by the user.

† These parameters are measured in single speed.

**Technical specifications:**

Size (W x H x D), Weight:  
48.3 x 13.2 x 65.5 cm (19" frame size);  
weight: 13.0 kg

**DVD A S1X - DVD A SM1X**

PULSTEC DVD Drive and PUH Specifications  
Wavelength: 650 +/- 5nm  
Numerical Aperture: 0.6 +/- 0.02  
Max. Laser Power: 0.3 mW  
Radial Tilt Control: +/- 1°

Specifications subject to change without notice



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