PULSE Automotive Test Manager — Type 7796

Based on the powerful PULSE™ platform, Automotive Test Manager Type 7796 (ATM) is a solution specifically developed for performing common noise and vibration measurements related to NVH troubleshooting and benchmark tests. By working closely with several leading automotive OEMs, we have been able to develop a system that meets the demands of common NVH test scenarios, providing real benefits in the form of enhanced productivity and improved data quality.

The ATM system focuses on ease-of-use and high performance. This, when combined with the state-of-the-art PULSE IDA^e hardware, make for an extremely powerful, compact, and easy to use system, suitable for both in-car and test cell applications.

USES AND FEATURES

USES
- NVH testing for the non-expert user
- Easy benchmark testing
- Simple execution of common NVH tests including:
  - Run-up/down order tracking
  - Constant speed order tracking
  - Narrow-band analysis
  - Mobility testing
  - Time signal analysis
- Versatile single-system solution covering all aspects of test and post-measurement activities
- Secured measurement procedure for fully traceable measurement results
- Easy in-vehicle measurements

FEATURES
- Step-by-step measurement guidance
- Multi-level user setup options
- Simplified workflow
- On-line test status
- Data-centric architecture
- Multi-language user interface
- Sharing of results via a central database
- Automatic labelling of results with user-selectable meta (header) data
- Powered by PULSE (real-time multi-analyzer)
- Scalable (channel count, analysis types, performance)
- Support of CAN Bus
- Aux Logger (slow parameters) support

Brüel & Kjær

PULSE Automotive Test Manager Type 7796 (ATM) is built around a selection of NVH test scenario-based templates, which are managed and executed using PULSE Data Manager Project Launcher.
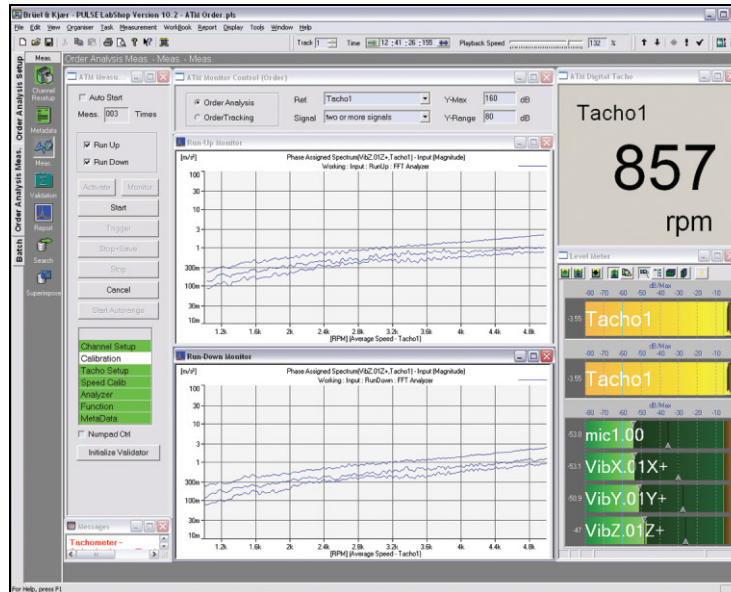
The ATM interface presents you with an easy to follow task-driven workflow. Following the tasks step-by-step takes you through system and measurement setup for the chosen measurement scenario. Time-saving database tools ensure that test documentation is stored together with measurement results in a safe and structured way, promoting easy re-use of test setups and documentation.

You will benefit greatly from the easy-to-use GUI and the range of features developed together with NVH professionals, who perform the same measurements as you.

Test Scenarios Powered by PULSE
ATM supports the PULSE family of front-ends. Most common transducer conditioning types are supported including CCLD (DeltaTron®), direct (voltage), charge and microphone input with 200 V polarization supply (LEMO). ATM also supports PULSE's Dyn-X hardware, which gives a dynamic range of up to 160 dB, removing the need to set attenuator ranges before measuring.

For engine testing, ATM supports multiple tachometers, CAN bus (Controller Area Network) and analogue auxiliary (slow) parameters.

In-vehicle testing is supplemented by PULSE In-vehicle Box Type 3643 and PULSE Remote Control ZH-0630. The In-vehicle Box provides a robust and portable system with a PC and PULSE front-end housed within the box and built-in WLAN unit. Options include a cigarette lighter tacho and CAN bus system interfaces. The rugged PULSE Remote Control is a 3-button control with a display for showing system status and engine RPM. It can be conveniently mounted in the vehicle so that the driver can operate the system without looking away from the road.

All hardware is CE marked.

Measurement

You have the choice of performing a real-time analysis in parallel with recording a time history, or retrieving a previously stored time history file for off-line analysis. Measurements can be run directly from the PC or remotely using wireless LAN or a standard reverse numerical keypad. The real-time capability of PULSE means that you can see the results as you measure.

Test results are auto-saved at the end of a test. The most recent results and any previous measurements, can be overlaid; multiple runs can be averaged together; and reports can be made using a single mouse click, removing the need for various additional operations with tools such as Microsoft® Excel. All compatible datasets can be easily compared and reported. Target curves can also be added to improve data evaluation.
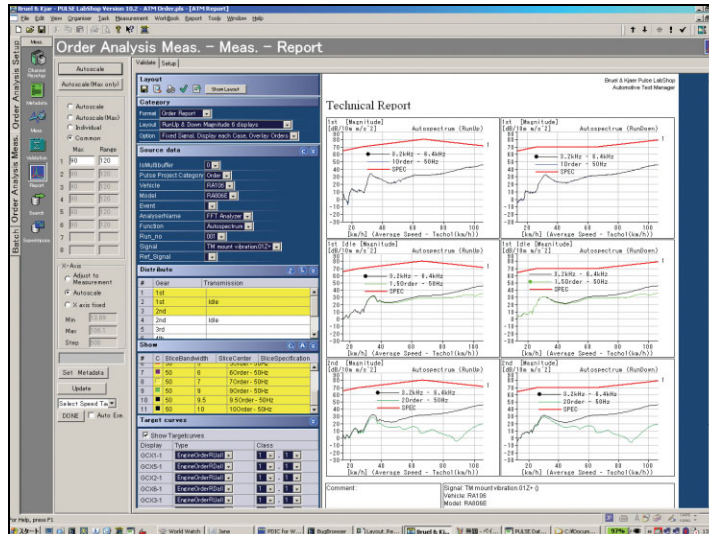
Measurement Configurations
The ATM measurement templates cover five common NVH test scenarios: Run-up/down and Static Order Tracking, Narrow-band Analysis, Time Signal Analysis and Mobility Testing:

- **Order Tracking – Run-up/down**
  For measuring machinery with rotating components running under non-stationary conditions such as run-up or coast-down tests. The system utilises the digital order tracking functionality of PULSE to generate waterfall data from which it extracts user-selected slices

- **Order Tracking – Static Orders**
  For measuring machinery with rotating components running at constant speed. With the Static Order template, dominant orders are extracted instead of slices
- **Narrow-band Analysis**
  In this template, view frequency content of a stationary signal
- **Time Signal Analysis**
  In the Time Signal Analysis template, there are tools for viewing, listening to and analysing time signals. Time domain analysis includes:
  - Time domain filtering of data
  - Peak-to-peak or zero-to-peak detection of the maximum value in the time signal, and extraction of a time block at the maximum value position
  - Fourier spectrum of the maximum value time block
  - RPM and vehicle speed profile for measurements with tacho information
  - Instantaneous RPM at maximum value position
  The template also provides tools for monitoring RPM while recording
- **Mobility Testing**
  The mobility template provides tools for doing simple impact hammer tests quickly and accurately in order to ascertain the resonant frequencies of components

Batch Measurements

A testplan feature enables multiple test variants to be configured prior to testing. The testplan then provides a graphical status display showing which measurements have been done and which measurements are still outstanding. After testing, data recordings can be batch processed with all of the selected analyses taking place unattended and with the results stored correctly labelled to database.

System Configurations

Both ATM hardware and software are scalable to suit your NVH testing needs.

- **Hardware:** Select the front-end configuration according to the channel count required
- **Software:** Purchase only those licenses essential for the ATM test scenarios you need
  - Standard PULSE bundles (for example, 3560-B-T 80 – T 84) that pair hardware with fixed software packages contain all the necessary licenses to support all ATM test scenarios allowing you to work with both ATM and PULSE Labshop
  - 7796-A-N is a single license that eliminates the need to buy any other software to run the ATM. There is only access to the ATM user interface with this license
  - 7796 is the ATM licence that can be added to existing PULSE installations that already have the necessary supporting licences

Specifications – PULSE Automotive Test Manager Type 7796

Automotive Test Manager Type 7796 is a NVH testing software working with PULSE Multi-analyzer System Type 3560

Type 7796 offers five measurement scenarios:
- Run-up/down Testing (order tracking)
- Static Orders (order tracking)
- Mobility Testing (hammer test)
- Narrow-band Analysis
- Time Signal Analysis

Note: Time data can be recorded simultaneously in all cases

Requirements

PC: Pentium® 4, 2.4 GHz or better with 1 GB RAM, or Pentium Centrino® 1.6 GHz or better with 1 GB RAM
Display: Minimum recommended display size: 1280 × 1024 pixels
Operating System: Windows® 2000 or XP

PULSE SOFTWARE REQUIREMENTS
FFT & CPB Analysis Type 7700-Nx
Order Analysis Type 7702-Nx
Analysis Engine Upgrade Type 7707
PULSE Data Manager Type 7767 A (includes Microsoft® MSDE database)
PULSE Time File Management Type 7789-A
PULSE Data Manager Validator BZ-5499

Measurement

ANALYSIS TYPES
- FFT Narrow-band Analysis
- 1/n-octave (CPB) Filtering
- Overall Levels (RMS and Peak)
- Order Tracking
- CAN Parameter Logging
- Analogue Auxiliary Parameter Logging

Individual Analyzer Specifications: Same as Basic PULSE Software Type 7700 and Order Analysis Type 7702. Please refer to the PULSE Software System Data (BU 0229)
Time Domain Filtering – Selectable Filter Types:
- High-pass
- Low-pass
- Bandpass
- Bandstop

Selectable Filter Form Including Q-factor
Time Domain Analysis:
- Peak-to-peak and zero-to-peak maximum value detection
- Fourier spectrum of maximum value time block
- Waveform display of maximum value time block

DATA VALIDATION AND DISPLAY PLOTS
Same as basic PULSE software Type 7700, with the addition of the following:

- Display of order tracking results as a function of engine speed or vehicle speed
- Multiple Z-axis in displays
- Persist previous run on screen option for multi-run measurements
- Integrated PULSE Data Manager Validator tools for:
  – Viewing data
  – Retrieving from database
  – Comparing
  – Averaging and displaying or saving to database
  – Reporting results

TRIGGERS
Start: User-definable in RPM
Stop: User-definable in RPM
Update: User-definable in RPM
Automatic calculation and setting of appropriate update trigger according to Z-axis buffer size

User Interface

Task driven user-interface with task-by-task configuration status notification
Visual tachometer setup tools
Missing information check for meta-data input
Option of listening to time signals
Workflow Features:
- Fully secured datacentric architecture
- All measurement templates, time recordings, report templates and analysis results stored in database
- Changes to measurement templates password protected
- Configuration lock option to prevent changes to system settings
- User-configurable global meta-data available via project launcher

Cursor and Cursor Fields: Same as in basic PULSE software Type 7700
Display Functionality: Same as in basic PULSE software Type 7700
Data Storage: XML data format

Database

Database Type: Microsoft® MSDE (via PULSE Data Manager Type 7767-A)
Database includes maintenance tool, field editor and tolerance curves
Search Options: Searches on all meta-data fields via user-defined SQL queries or targeted via Validator function
Copy Options: From one database to another:
- Selected data
- All meta-data
- All tolerance curves

Reporting

Via Microsoft® Word templates or HTML-based templates accessed in Validator function

Ordering Information

Software Only

Type 7796-X[1]   PULSE Automotive Test Manager
Type 7796-A-X[1]   PULSE Basic Automotive Test Manager

Maintenance and Upgrade Agreement

M1-7796-X[1]   PULSE ATM Software Maintenance and Support Agreement
M1-7796 A-X[1]   PULSE Basic ATM Software Maintenance and Support Agreement

1.Where 'X' indicates the license model, either N: node-locked, or F: floating

Recommended PULSE Configurations

Type No. and Product Name	Description	Included Licenses[a]
Hardware and Software Bundles		
3560-B-T 82 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 5-channel with a BNC equipped 3560-B frame	7700-N-5, 7702-N-5, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-B-T 84 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 5-channel with a Lemo equipped 3560-B frame	7700-N-5, 7702-N-5, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-B-X 82 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 5-channel with a BNC equipped Dyn-X 3560-B frame	7700-N-5, 7702-N-5, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-C-T 81 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 12-channel with a BNC equipped 3560-C frame	7700-N-12, 7702-N-12, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-C-X 81 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 12-channel with a BNC equipped Dyn-X 3560-C frame	7700-N-12, 7702-N-12, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-C-T 80 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 17-channel with a BNC equipped 3560-C frame	7700-N-16, 7702-N-16, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-C-T 83 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 17-channel with a BNC + Lemo equipped 3560-C frame	7700-N-16, 7702-N-16, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
3560-C-X 80 PULSE Automotive Test Manager Bundle	PULSE ATM Standard Configuration – 17-channel with a BNC equipped Dyn-X 3560-C frame	7700-N-16, 7702-N-16, 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499
Single Software Licenses		
7796-A-N5 PULSE Basic Automotive Test Manager	PULSE ATM Single, GUI-locked License – 5-channel license containing same features and analysis types as the Standard Configuration	7796-A-N5
7796-A-N12 PULSE Basic Automotive Test Manager	PULSE ATM Single GUI-locked License – 12-channel license containing same features and analysis types as the Standard Configuration	7796-A-N12
7796-A-N17 PULSE Basic Automotive Test Manager	PULSE ATM Single, GUI-locked License – 17-channel license containing same features and analysis types as the Standard Configuration	7796-A-N17
Standard Software License		
7796 PULSE Automotive Test Manager Software License	PULSE ATM Standard License – Requires 7700-N-X[b], 7702-N-X[b], 7707, 7708, 7767-A, 7789-A, 7796 and BZ-5499 to operate all templates	7796

a. 'N' in the type numbers indicates node-locked
b. 'X' in the type number indicates the number of channels: 5, 12 or 17

Optional Software and Hardware

Type/Part No.[a]	Description	PULSE Configuration 5-ch. System	12-ch. System	17-ch. System	Analysis Only
Application Software					
7796-A-N	PULSE Basic Automotive Test Manager	1	1	1	1
7796-X	PULSE Automotive Test Manager	1	1	1	1
BZ-5499-X	PULSE Data Manager Validator	1	1	1	1
7700	FFT & CPB Analysis	1	1	1	1
7702	Order Analysis	1	1	1	1
7707	Analysis Engine Upgrade	1	1	1	1
7767-A	PULSE Data Manager (single-user license)	1	1	1	1
7789-A	PULSE Time File Management	1	1	1	1
Accessories and Options					
BK-0058	Software Installation and Configuration, per day	1	1	1	1
BZ-5610	PULSE CAN Bus Option	1	1	1	
WQ-2350	Cigarette Lighter Tacho Sensor	1	1	1	1
3643-A-X	PULSE In-vehicle Box	1	–	–	–
Notebooks and Operating Systems					
7201-A-xx[b, c]	Dell™ Latitude® High-end Notebook PC	–	1	1	1
UL-0207-xx[b]	Microsoft® Office 2003 Professional Edition	–	1	1	1
UL-0208-xx[b]	Microsoft® Office 2003 Small Business Edition	–	1	1	1
Data Management					
7767-B-X	PULSE Data Manager (5-user license)				1
7767-C-X	PULSE Data Manager (10-user license)				1
BZ-5443-X	PULSE Data Manager Acquisition and Browsing				1
BZ-5444-X	PULSE Data Manager Browsing License				1
BZ-5445	5-user Microsoft® SQL Server 2000 Standard Edition				1
BZ-5446	10-user Microsoft® SQL Server 2000 Standard Edition				1
Modal Analysis					
7753-X	PULSE Modal Test Consultant™				1
7754-X	ME'ScopeVES™ Modal and Structural Analysis				1
Sound Quality					
7698-X	PULSE Sound Quality				1
BZ-5265-X	PULSE Sound Quality Zwicker Loudness				1
BZ-5277-X	PULSE Sound Quality Order Analysis				1

a. 'X' in the type numbers indicates the license model, either: node-locked (N), or floating (F)
b. 'xx' specifies country: GB, DE, FR, ES, IT, SE, DK or US
c. Laptop does not include Microsoft® Office

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