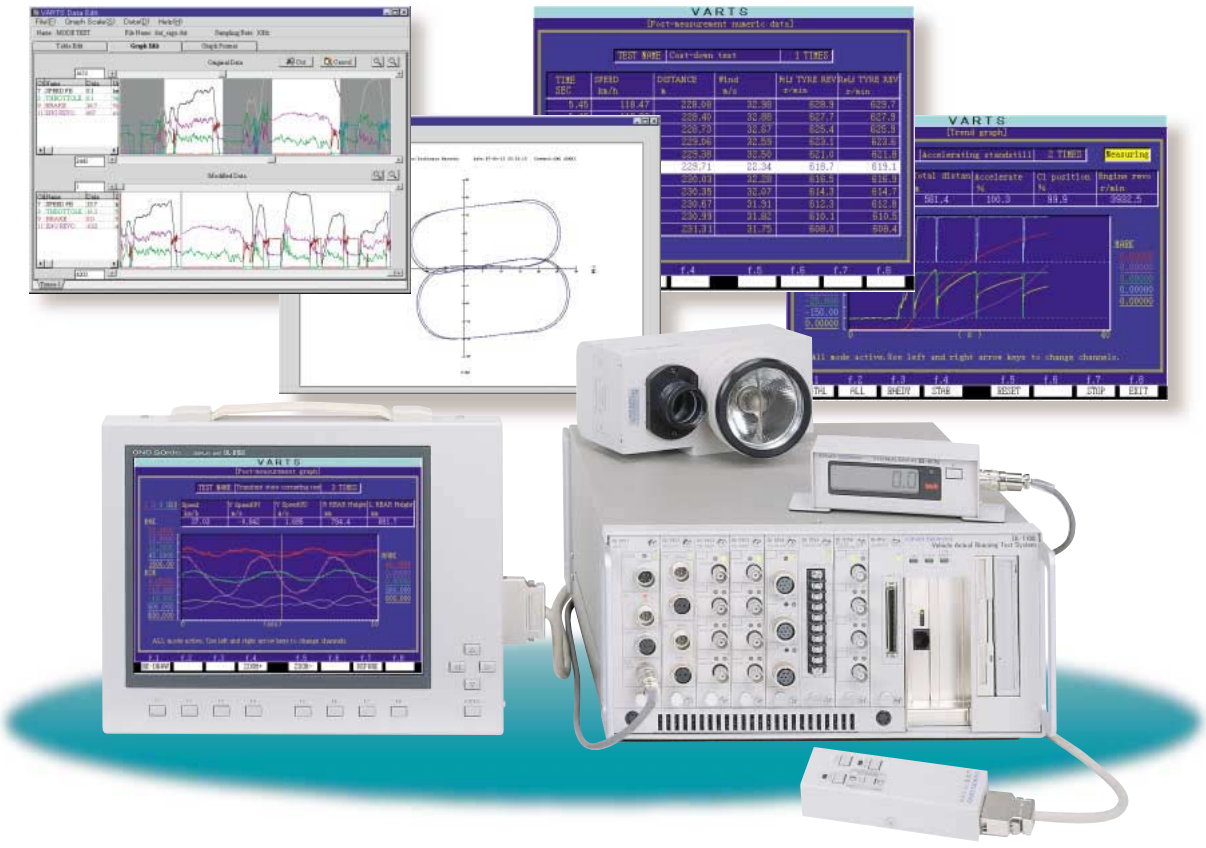
Discontinued
(Reference only)



DATA LOGGER SYSTEM

DL-1000/2000 Series

The hardware components can be freely combined to support
the different types of sensors, allowing you to build a compact test system
that can best meet your measurement needs,
especially for actual running tests of vehicles.
The DL-1000/2000 series can easily carry out a sequence of measurement tasks,
from data acquisition to data processing, at unprecedented speeds.

ONO SOKKI

The DL-1000/2000 series offers further breakthroughs in data acquisition and processing.

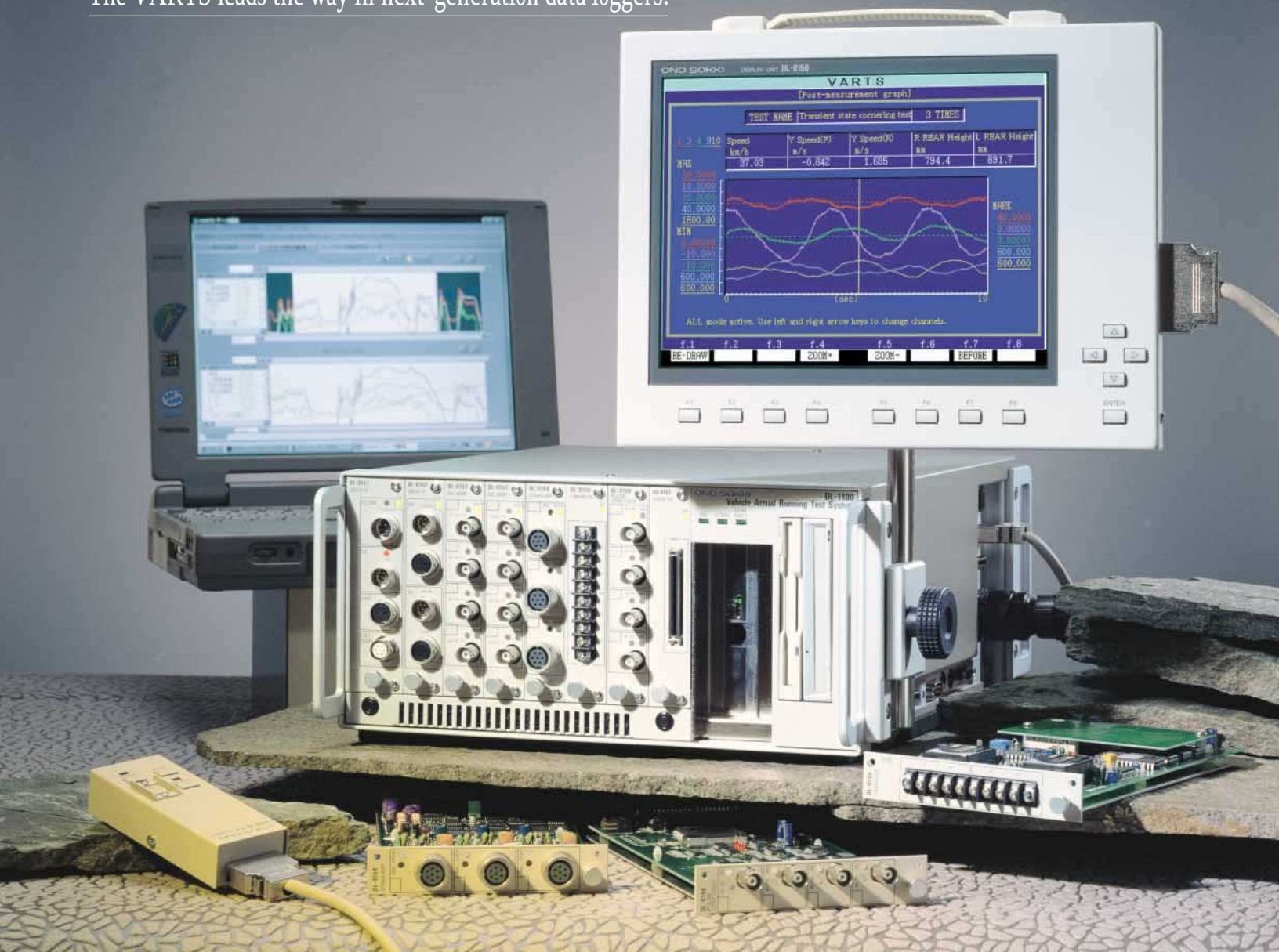
Data loggers are used in a variety of applications and therefore have a number of basic performance requirements. These include:

- high resistance to mechanical vibration and shock in consideration of vehicle running tests,
- flexibility and expandability in regard to changing or adding measuring modules according to test purposes,
- a monitoring function for examining waveforms,
- zoom and cursor functions for reading data values,
- downsized design that achieves higher space-to-performance ratios and reduces the carry load, and
- compatibility with computers that have increased memory capacity and support the recent technological advancements in networking.

The DL-1000/2000 series of data logger systems, or Vehicle Actual Running Test Systems (VARTSs), allow you to combine a variety of measuring modules and peripherals to configure a data acquisition and processing system best suited to your measurement needs.

ONO SOKKI has incorporated the various data logger requirements into its design concept as fundamental specifications, achieving a high degree of satisfaction.

The VARTS leads the way in next-generation data loggers.

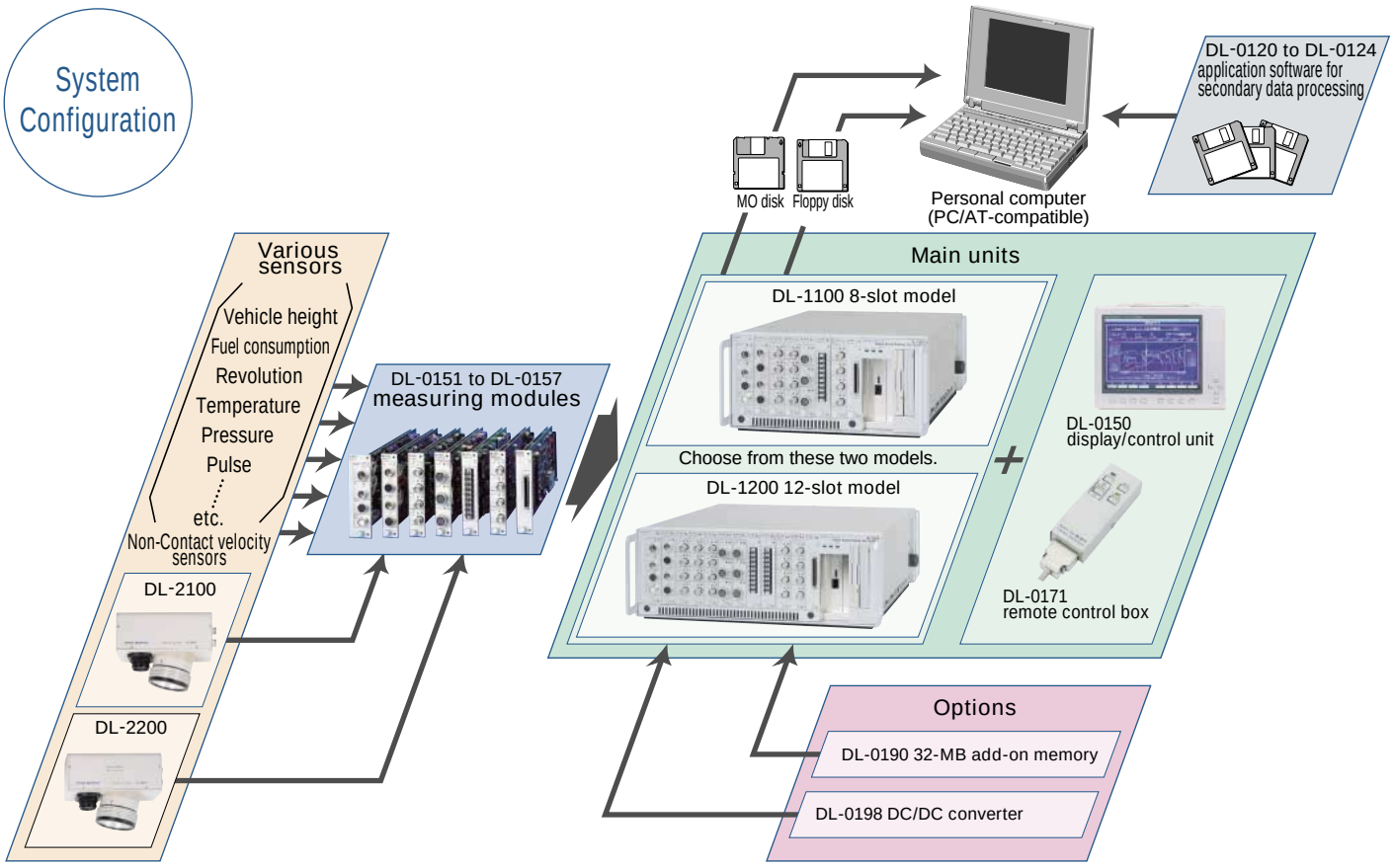


Features

1. Increases test efficiency through seamless, on-site data acquisition, examination and processing
2. Supports different types of tests with its flexible combination of measuring modules
3. Lightweight, compact and highly resistant to mechanical vibration
4. Supports data acquisition over long periods by means of a standard 32-MB memory (or optional 96-MB memory)
5. A wide choice of non-contact velocity sensors which are required for actual running tests
6. An enhanced family of software tools for secondary data processing related to the various running tests

VARTS

System Configuration



DL-1100/1200

Main Units

The data logger system (VARTS) consists of a main unit, which forms the core of the system and houses the measuring modules; a display control unit, which can be separated from the main unit; and a remote control box, which allows data acquisition to be stopped and started from remote locations. The main unit comes in two types; either an 8-slot model or a 12-slot model, depending on the number of measuring modules installed. Each model comes with a standard 32MB of data recording memory. Magneto-optic (MO) and floppy drives are provided as the standard equipment for data storage media.

Specifications

DL-1100/1200 Main Units

Number of slots : 8 (DL-1100) 12 (DL-1200)
Sampling frequency (for time mode) : 2, 5, 10, 20, 50, 100, 200 and 500 Hz and 1, 2 and 5 kHz (selectable ; restrictions apply to the number of measuring modules for 2 kHz and 5 kHz sampling)
Sampling distance (for distance mode*) : 0.01, 0.10, 1, 10 and 100 m selectable
Data memory capacity : 32 MB as standard (expandable to 64 MB or 96 MB as options)
Data storage memory : Approx. 10 MB (flash memory)
Disk storage : 3.5-in. floppy drive (1.44-MB format) MO drive (128/230 MB)
Trigger function : Pre-trigger, post-trigger and loop trigger
Digital input : 8 bits (TTL) (6 bits if the DL-0151 is used)
LPT connector : Used to output data to a printer
Power supply : 10 to 15VDC 5A or less (excluding the projector for velocity sensor)
Operating temperature : 0 to +40℃
Outer dimensions : DL-1100 319(W)×149(H)×350(D)mm
DL-1200 424(W)×149(H)×350(D)mm
Weight : Dl-1100 Approx. 10kg (with measurement modules fully installed)
Dl-1200 Approx. 12kg (with measurement modules fully installed)

*Distance-mode sampling is available when DL-2100 and DL-0151 are used.

DL-1100

DL-1200

DL-0150 Display/Control Unit

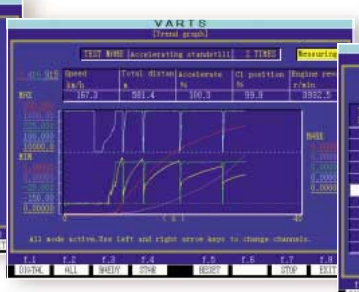
Display unit : 10.4-in. TFT color LCD
Resolution : 640×480 dots
Controls : Four cursor keys, an enter key and function keys
Outer dimensions : 296(W)×230(H)×28(D)mm

DL-0171 Remote Control Box

Controls : Sampling command switches (START, STOP, RESET and READY), and status indicators

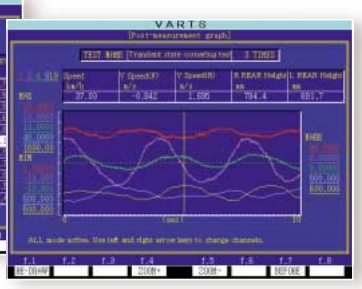
DL-0150 Screen Examples

Measurement Module Setup



Measurement Data Monitoring

Numeric Data Display



Graphic Data Display

DL-0151 to DL-0157
Measuring Modules

Measuring modules make up the signal input section of the system, and come in seven types:

- Module for measuring forward velocity and fuel consumption
- Four-channel DC amplifier
- Two-channel thermocouple converter
- Thirty-two-channel digital input (DI) module
- Two-channel module for measuring lateral velocity
- Three-channel strain amplifier
- Four-channel pulse conditioner

Different combinations of these modules support different types of tests. Thus, the ability to make combinations flexibly means you can build a compact test system best suited to your varying measurement needs.

Specifications

DL-0151 Forward Velocity and Fuel Consumption Module

① Forward Velocity

Measured items	:	Velocity, detection of white line markers, forward mileage, backward mileage and resultant mileage
Input signal	:	1 cm/pulse (TTL) signal with 90° phase difference
Unit	:	km/h, mph (velocity), km, mile (distance)
Velocity range	:	Forward(+) 0.4 to 390 km/h Reverse(−) 0.4 to 120 km/h (Unable to measure 0 to ±0.4 km/h)
Measurement resolution	:	0.012 km/h
Display resolution	:	0.1 km/h (DL-0170 velocity display unit)
Velocity display unit	:	DL-0170 6-digit LCD display for velocity readings (standard accessory)

DL-0170

② Fuel Consumption

Measured items	:	Fuel consumption (quantity and rate)
Input signal	:	1, 0.1 or 0.01 ml/pulse (TTL) signal with 90° phase difference
Units	:	ℓ, gallon (quantity) km/ℓ, mile/gallon (rate)
Measurement resolution	:	1, 0.1 or 0.01 ml

DL-0152 Two-Channel Lateral Velocity Module

Measured items	:	Lateral velocity, forward lateral mileage, backward lateral mileage and resultant lateral mileage (each is measured by both the front and rear sensors)
Input signal	:	1.25 mm/pulse (TTL) signal with 90° phase difference
Units	:	m/s (velocity); m (distance)
Velocity range	:	0 to ±32 m/s
Measurement resolution	:	0.001 m/s

DL-0153 Four-Channel DC Amplifier
(also used as a device for receiving input from acceleration pickups)

Input voltage range	:	±0.5, 1, 2, 5 or 10 V
Frequency bandwidth	:	DC to 100 kHz
Lowpass filter	:	100 Hz, 1 kHz, 10 kHz or OFF

DL-0154 Three-Channel Strain Amplifier

Measuring range	:	$\pm 500\times10^{-6}$, 1000×10^{-6}, 2000×10^{-6} or 5000×10^{-6} strain
Frequency bandwidth	:	DC to 5 kHz
Lowpass filter	:	100 Hz, 1 kHz or OFF

DL-0155 Two-Channel Thermocouple Converter

Type of thermocouple	:	K, J, T and R
Measuring range	:	−50 to +1500°C, depending on the range of each thermocouple
Frequency bandwidth	:	DC or 2 Hz

DL-0156 Four-Channel Pulse Conditioner

Input signals	:	TTL / NORMAL
Trigger level	:	±5 V/8 bits
Frequency range	:	1 MHz max.
Scaling factor	:	1 to 1/256
Counters	:	24 bit
Measured items	:	Cumulative pulse count, period, frequency and duty ratio

DL-0157 32-Channel Digital Input (DI) Module

Input types	:	TTL, open collector, and dry contact
Withstanding input voltage	:	30 V
Frequency range	:	1 MHz max.

DL-2100/2200

Non-contact Velocity Sensors

ONO SOKKI has now added the DL-2100/2200, small and lightweight, non-contact velocity sensors necessary for actual running tests.
The DL-2100 forward velocity sensor can detect velocities of as low as 0.4 km/h to as high as 390 km/h. The sensor not only provides the main signal for measuring the velocity and mileage, but can simultaneously transmit both the standstill signal and white line detection signal. The sensor provides these signals as auxiliary data to support the measurement results.
The DL-2200 lateral velocity sensor has a wide 0 to ±32 m/s range for detecting the lateral velocity of a vehicle. When in use, the sensor is attached to the front and rear of the vehicle.

Specifications

DL-2100 Forward Velocity Sensor

Output signal	: 1 cm/pulse (TTL) signal with 90° phase difference White line detection signal (analog) Standstill signal (TTL)
Velocity range	: Forward(+) 0.4 to 390 km/h Reverse (−) 0.4 to 120 km/h (Unable to measure 0 to ±0.4 km/h)
Sensor mounting height	: 280 ±60 mm
Power supply for the projector	: 12 V DC , 50 W, supplied from DL-0151

DL-2200 Lateral Velocity Sensor

Output signal	: 1.25 mm/pulse (TTL) signal with 90° phase difference
Measuring range of velocity	: 0 to ±32 m/s
Sensor mounting height	: 280 ±60 mm
Power supply for the projector	: 12 V DC , 50 W for each, supplied from DL-0152(for two projectors)

Options

DL-0190 Add-on Memory (32 MB)

The system comes with a standard 32MB of data memory, which can be expanded in 32-MB increments up to 96 MB.

DL-0198 DC/DC Converter

The DL-0198 DC/DC converter for 24-V DC input comes in handy when using a system on board a truck or bus, that runs on a 24-V DC battery.

Input voltage	: 24 V DC (18 to 36 V DC)
Output voltage	: 12 V DC at 10 A

DL-0120 to DL-0124

Application Software for Secondary Data Processing

Data acquired and saved using the data logger system can be downloaded onto a personal computer using a disk drive (floppy or MO) for on-the-spot secondary data processing. All of the secondary data processing software tools are standardized to operate on a Windows 95 platform. These features allow you to carry out a sequence of on-site tasks, from data acquisition to data processing, seamlessly and, as a result, dramatically reduce the time required for the test.
There is a wide choice of application software tools designed for actual running tests, which are especially useful. If combined with a notebook PC, they can significantly increase test efficiency.

DL-0120 Basic Data-Editing Software

This software sorts and edits data acquired and saved by the VARTS, and converts data files into the ASCII format. Data saved as an ASCII file can be submitted for secondary processing using general-purpose spreadsheet software.

Data editing functions
- zooming
- cursor-selected data reading
- partial removal of a data array
- smoothing of a data array using the moving average method

File conversion and saving function
- data saving in the binary format
- conversion of data to the ASCII format

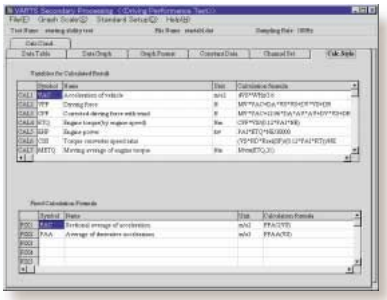
Drawing function

Partial removal of measured data

DL-0121 Data Processing Software for Driving Performance Tests

Processing Functions
- Acceleration from standstill test
- Passing ability test
- Maximum speed test
- Low speed running test
- Starting ability test
- Coast-down test

Drawing function

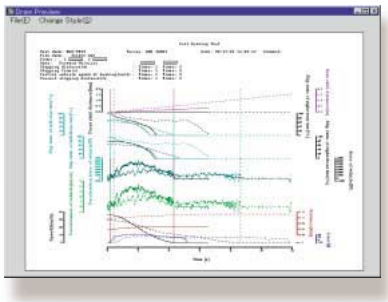


Symbols and equations used in data processing for starting ability test

DL-0122 Data Processing Software for Brake Performance Tests

Processing Functions
- Full braking test
- Partial braking test
- Emergency brake test
- Fade/recovery test
- Auxiliary brake test

Drawing function

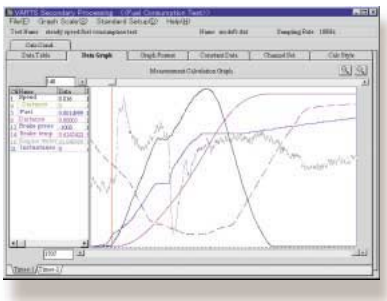


Data processing for full braking test and preview of overlay drawing

DL-0123 Data Processing Software for Fuel Consumption Tests

Processing Functions
- Steady speed fuel consumption test
- Urban cycle fuel consumption test
- Hill climbing fuel consumption test
- Actual traffic fuel consumption test

Drawing function

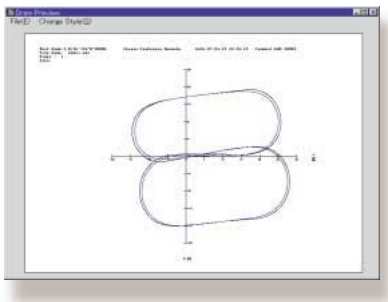


Data processing and results for urban cycle fuel consumption test

DL-0124 Data Processing Software for Driving Stability Tests

Processing Functions
- Steady-state cornering test
- Transient-state cornering test
- Obstacle-avoidance maneuver test

Drawing function



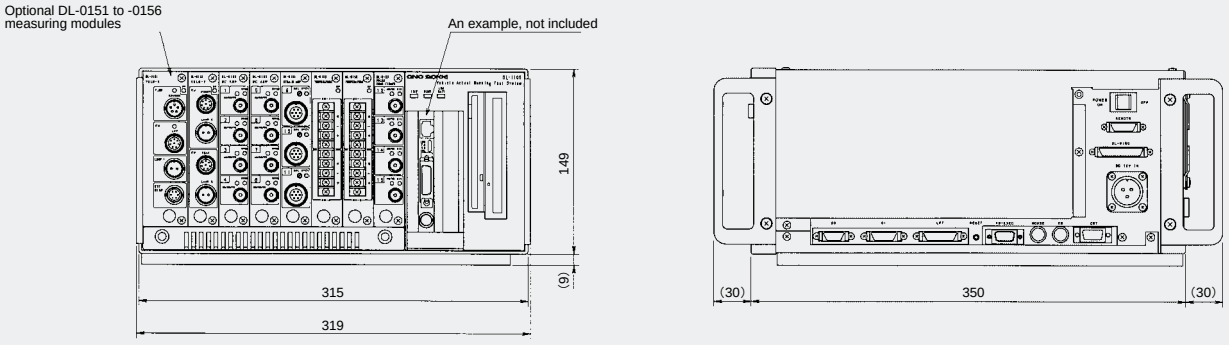
Data processing for transient-state cornering test and preview of running locus

Outer Dimensions

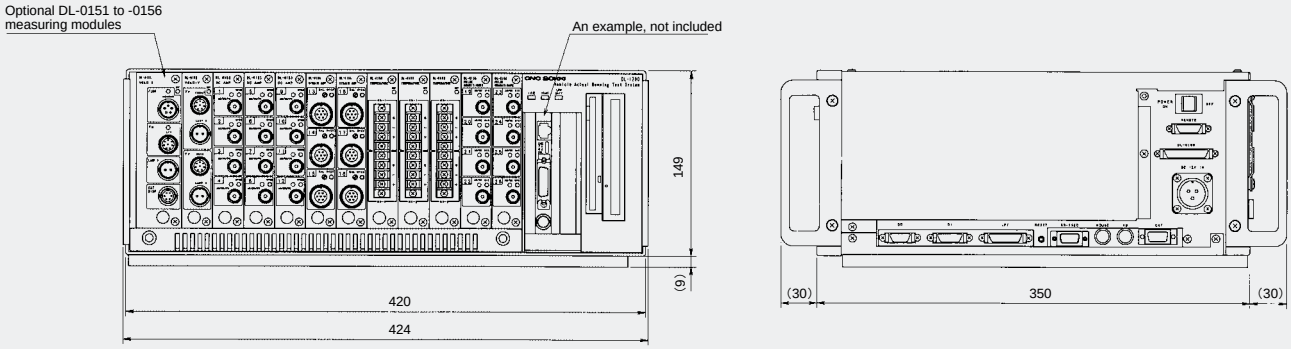
DL-1100/1200 Main Units

（Unit : mm）

DL-1100

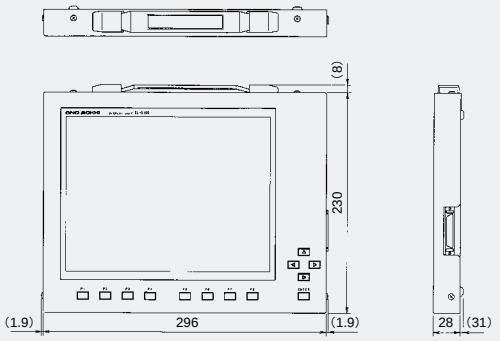


DL-1200

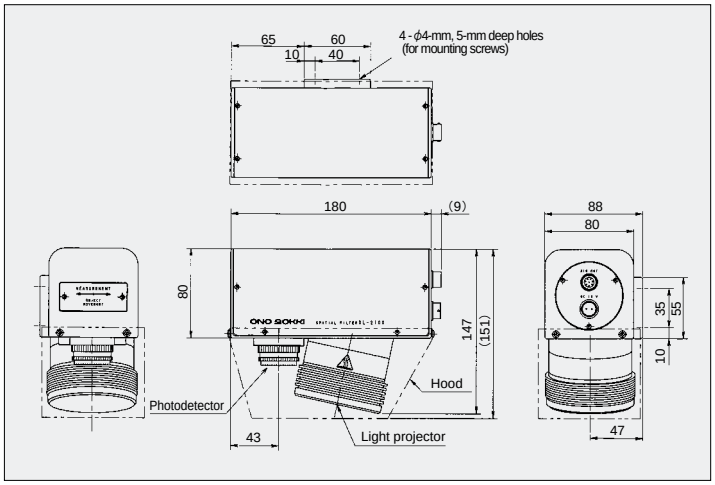


※Measurement modules are optional.

DL-0150 Display and Control Unit



DL-2100 and DL-2200 Non-contact Velocity Sensors (Common)



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∗Outer appearance and specifications are subject to change without prior notice.

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Printed in Japan 985(SK)3K