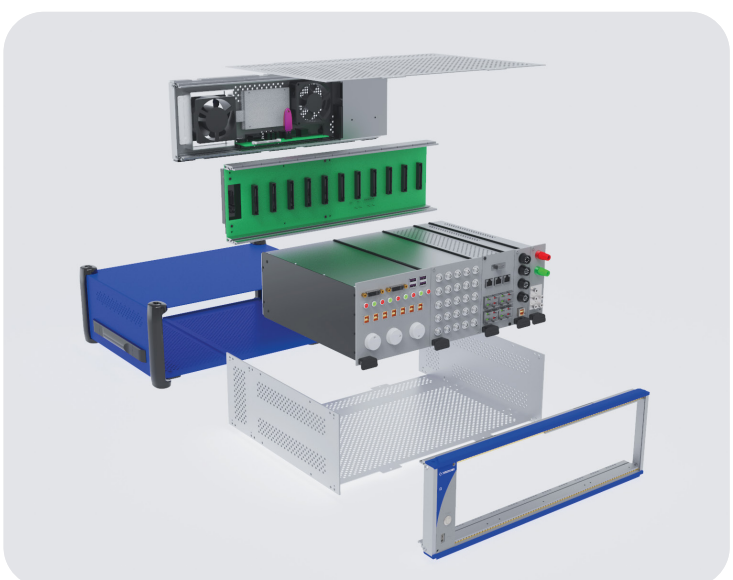
FreeDesign Intelligent Instrument Development Platform

Modular Chassis for Customizable Test & Measurement Solutions

Product Overview

Dimension Technology's FreeDesign Intelligent Instrument Development Platform adopts a 1-chassis + N-modules architecture, empowering users to efficiently develop and deploy versatile test & measurement systems tailored for optical communication applications. This compact, PC-sized platform integrates multiple measurement modules, enabling flexible customization for R&D, automated production testing, and high-speed optical component validation.



FreeDesign Where can it be applied?

FreeDesign provides high performance, high precision, high degree of freedom of testing methods; can meet the needs of various testing scenarios, and give you the most extensive creative space.

- Custom optical test instruments
- Real-time production monitoring
- R&D labs

Key Features

High Compatibility

The FreeDesign Intelligent Instrument Development Platform is compatible with all existing test modules from Dimensional, as well as user-developed modules based on USB interfaces. Breaking traditional limitations, it adopts a standard USB protocol for communication, ensuring compatibility with a wide range of test modules and enabling seamless control of all module operations. This truly achieves multi-functionality within a single device and unifies the testing system.

Modular Flexibility

The FreeDesign Intelligent Instrument Development System features a modular design, allowing users to select and combine various measurement modules as needed, making it adaptable to different applications.

Industrial Reliability

FreeDesign system has the characteristics of accurate reliability and robust durability, reliable operation in harsh environmental conditions. The internal heat dissipation system and anti-electromagnetic interference ability of the chassis also help to maintain stable performance and accurate measurement results.

Lab-Grade Design

The FreeDesign chassis and modules feature Dimensional's professional-grade scientific design, optimizing everything from internal systems to user operation, hardware layout, and visual presentation. Simplicity and efficiency are core principles. For example, the chassis includes a built-in gravity sensor, allowing it to operate normally in both horizontal and vertical orientations, maximizing space utilization.

Core Advantages

- **Separated hardware architecture design**

The platform adopts a hardware architecture design consisting of a core board, backplane, and functional test modules. The core board and functional test modules communicate using the standard USB protocol.

- **Platform + modular design**

Platform + modular design, compatible with various test modules, offering flexible configuration and easy expansion.

- **Hot-swappable**

The chassis features built-in slot recognition and power-on control, supporting hot-swapping.

- **multiple control methods**

The module control board provides multiple control interfaces, including USB, SPI, and serial ports.

- **control and automation**

The platform supports network and USB control, enabling multiple test instruments to work together for automated testing systems.

- **Configuration and Performance**

The OMEGA test platform adopts the Intel Skylake-U architecture with an onboard Core i5 CPU. The ALPHA test platform features an ARM+Linux architecture with a built-in touch display, supporting both button and touch control for greater flexibility.

- **Abundant Slots**

OMEGA offers 11 slots, supporting up to 10 functional modules, while ALPHA provides dual slots for two functional modules.

- **Industrial Design**

OMEGA is designed with a standard 19-inch 3U chassis, suitable for rack or desktop testing.

- **Module Power Supply**

Modules support a 24V/2A power supply, providing up to 48W for functional modules.

Product Introduction

The platform is the foundation of the FreeDesign intelligent instrument development system, designed to accommodate controllers and modules. It provides power, communication interfaces, and efficient heat dissipation for smart instrument development. We offer two platform variants: a 2-slot and an 11-slot version (as well as a simplified version without an embedded industrial PC system) to meet various portable and desktop application needs.

OMEGA 2.0 Chassis

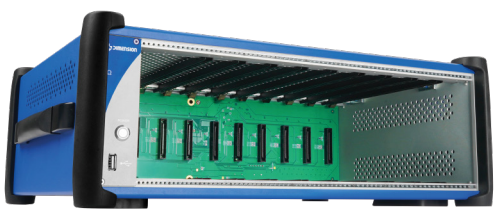
Next-Generation Intelligent Instrument Development chassis

(1) High-Resolution Touchscreen + Independent Control

Compared with OMEGA 1.0, OMEGA 2.0 features a high-resolution touchscreen that allows users tomonitor status, switch functions, and operate modules directly on the platform - eliminating theneed for an external PC or display and enabling more convenient on-site control and debugging.

(2) Supports SCPI commands for easier programming

Now fully compatible with the SCPI standard command set and equipped with a USBcommunication interface, enabling fast integration with automated testing systems. It supportsmultiple programming environments such as Python, C++, and LabVIEW, offering lowerdevelopment barriers and higher system integration efficiency.



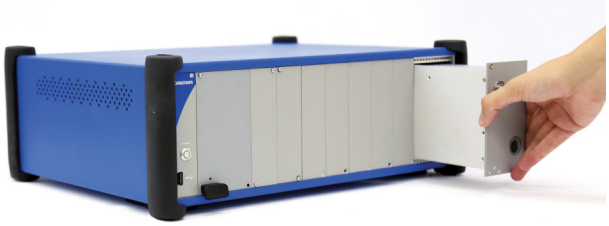
OMEGA Chassis

High-Capacity Intelligent Instrument Development Chassis

It is a high-performance, high-capacity chassis model launched by Dimension, equipped with an Intel i5-6300U 2.4GHz processor (standard) and an optional i7-6600U 2.6GHz processor. It features 11 expandable and programmable slots with 10 module slots and adopts the internationally standardized 3U 19″ test instrument development platform size.

OMEGA LITE Chassis

High-Capacity Intelligent Instrument Development Chassis



The Omega Lite chassis retains 10 functional module slots and standard communication configurations while removing the processor and chipset. This enhances user development flexibility and cost-effectiveness, allowing for the creation of instruments that better suit the user's research and testing needs within the overall framework.

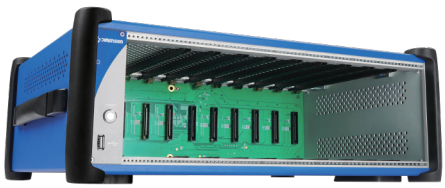
ALPHA Touchscreen

Compact Intelligent Instrument Development Chassis

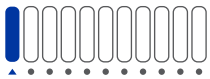
ALPHA is a compact, programmable dual-slot platform that adopts an ARM+Linux architecture. It features a 3.2'' touch display with a built-in GUI, supporting both button and touch control for quick and accurate measurements without the need for additional PC or control devices, making it flexible and convenient. The ALPHA chassis is equipped with a gravity sensor, supporting both landscape and portrait orientations. It is highly suitable for laboratory or small-scale automated production testing environments.

OMEGA 2.0 Chassis

10 Slots 10 functional modules
RK3588J processor



OMEGA Chassis



11 Slots 10 functional modules
I5-6300U 2.4GHz processor

ALPHA Touchscreen

2 Slots 2 functional modules
ARMV7 processor

Model	OMEGA 2.0	OMEGA Lite	OMEGA Chassis	ALPHA Touchscreen
Staructure	3U 19" Industrial standard	3U 19" Industrial standard	3U 19" Industrial standard	NA
Slots	10 Slots, 10 functional modules	11 Slots, 10 functional modules	11 Slots, 10 functional modules	2 Slots, 2 functional modules
Processor	RK3588J	NA	i5-6300U 2.4GHz (standard) i7-6600U 2.6GHz(customizable)	ARMV7
Chipset	NA	NA	Skylake-U	NA
Communication	USB2.0	USB2.0	USB2.0	USB2.0
Serial port	Baud rate: 115200,RS232*1	NA	RS232*1	RS232*1
Network card	TCP/IP, 10M/100M/1000M Ethernet	NA	10M/100M/1000M Ethernet	10M/100M Ethernet
USB	USB-TMC, USB3.0*1, USB2.0*3	USB2.0*1	USB3.0*3, USB2.0*1	USB2.0*2
Trigger interface	Supporting	Supporting	Supporting	Supporting
Power supply	24V/2A	24V/2A	24V/2A	24V/2A
Input voltage	AC 90~260V 50Hz	AC 90~260V 50Hz	AC 90~260V 50Hz	AC 90~260V 50Hz
Size	462mm*374mm*171mm	462mm*374mm*171mm	462mm*374mm*171mm	359mm*274mm*115mm

Modules

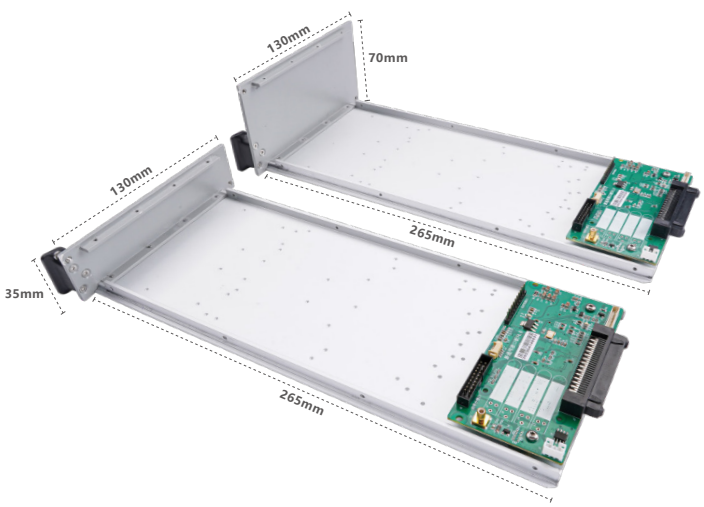
On the FreeDesign testing platform, users can use any function module that is compatible with the USB protocol and packaged according to the specified dimensions. You can build a testing system using Dimension Technology's existing modules, or opt for a custom design approach. Dimension Technology's module upgrade and optimization services will always be with you. We are committed to innovation and development, continuously optimizing existing modules and expanding new features to meet the increasingly complex testing demands and scenarios.

Chassis Customization Service

Both Omega and Omega Lite are designed according to the standard 3U19" size, making them ideal for building large-scale test system platforms. Users can customize models to fit cabinet sizes according to their needs.

Module Custom Development

Based on the FreeDesign chassis, we recommend users design their own modules using a single-slot/double-slot packaging method, which efficiently utilizes the chassis space while ensuring compatibility. The dimensions for single-slot/double-slot modules are 265mm×130mm×35/70mm. If needed, you can design multi-slot modules according to your specific requirements.



Controller Software

The Omega series test chassis uses OmegaController software to display and control various modules on the PC end. It allows for fast data acquisition and processing of different modules on the software, facilitating quick interactive measurements with users.

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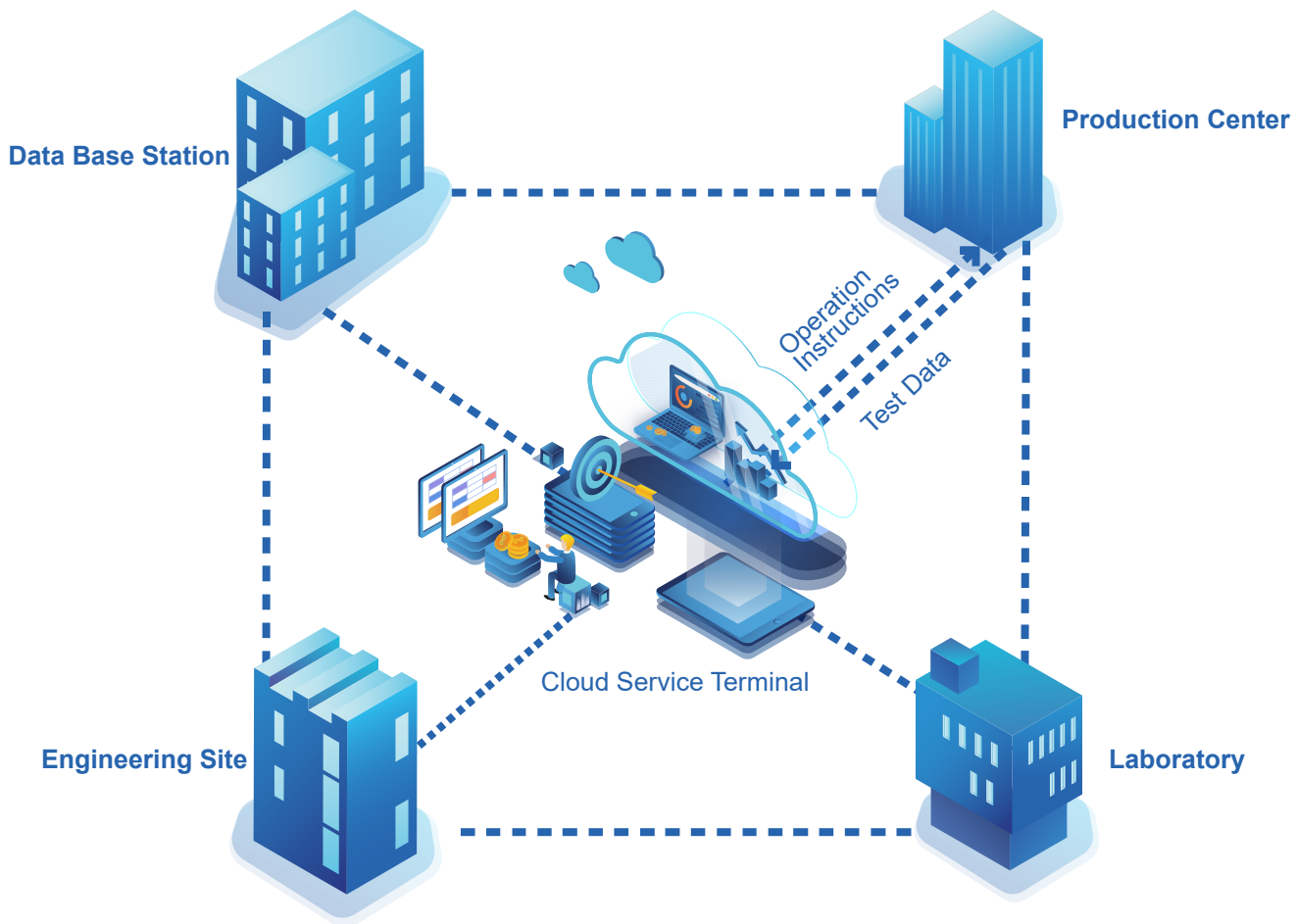
The Alpha series test chassis can also use AlphaController software to operate test tasks on the PC end. Through the software, multiple test platforms can be easily interconnected, helping you develop your intelligent testing system.

Cloud-based Testing System

Building a Future-Ready Cloud Testing Network for You



Based on the comprehensive development of 5G networks and cloud data, FreeDesign supports cloud testing functionality. Users simply need to input the physical address of each device into the network system, log in using standard software, and remotely control every test instrument from thousands of miles away. The instrument's test data can be uploaded to a cloud data storage center, allowing engineers to analyze and process this data from any computer connected to a private network, achieving cloud-based interconnectivity of testing devices.