

# sysGen devCUBE User Guide



## Introduction

### Background

Deep learning is one of the fastest growing segments in the machine learning/artificial intelligence field. It uses algorithms to model high-level abstractions of data in order to gain meaningful insight for practical application. Such data manipulation has application in various fields, such as computer vision, speech recognition and language processing, and audio recognition.

It takes tremendous processing power to efficiently process such huge amounts of data using deep learning algorithms. To that end, sysGen offers an all-in-one, powerful, energy-efficient, cool, and quiet desktside solution, called the sysGen devCUBE.



### devCUBE Overview

The devCUBE combines the world's best hardware, software, and systems engineering for deep learning in a powerful solution that can fit under your desk. It is a single desktside machine comprised of:

- Up to Four NVIDIA GeForce TITAN X GPUs
- NVIDIA DIGITS software: Interactive Deep Learning GPU Training System
- Pre-installed Ubuntu 14.04.2
- Pre-installed deep learning frameworks – Caffe, Torch, Theano, and BIDMach
- NVIDIA CUDA Deep Learning Neural Network library (cuDNN) v2
- NVIDIA CUDA Toolkit 7.0

### devCUBE Specification

#### Feature and Architecture Summary

##### **CPU**

Intel Core i7 processor on an ASUS x99E-WS motherboard with 64 GB DDR4 memory

##### **GPU**

Up to Four NVIDIA GeForce TITAN X GPUs, installed with NVIDIA qualified drivers

##### **Operating System and Software**

The system comes with the following software and OS pre-installed on the SATA3 SSD:



- Ubuntu 14.04.2
- NVIDIA DIGITS Software
- Caffe, Torch, Theano, and BIDMach deep learning frameworks
- NVIDIA CUDA Toolkit 7.0, including the CUDA Deep Learning Neural Network library (cuDNN) v2.

### Storage

Internal (swap-Frame): 3x 3.5" HDD and 6x 2.5" HDD / SSD drives

External (hot swap): 8x 2.5" HDD / SSD drives (pre-selected) or 3x 3.5" HDD drives

## Component Specifications

### Components

Component	Qty	Description
Motherboard	1	ASUS X99-E WS with 4xPCIe x16 slots. For the full motherboard spec, see <a href="http://dlcdnet.asus.com/pub/ASUS/server/e9552_x99_e_ws_ug_for_web_only.pdf">http://dlcdnet.asus.com/pub/ASUS/server/e9552_x99_e_ws_ug_for_web_only.pdf</a>
CPU	1	Intel 6-core i7-5930K
RAM	2	2x32 GB DDR4 (4x8GB) DDR4 DRAM 2133MHz)
GPU	4	GeForce TITAN X, featuring: <ul style="list-style-type: none"> <li>• 7 teraflops of single-precision computing power,</li> <li>• 336.5 GB/s of memory bandwidth, and</li> <li>• 12 GB of memory</li> </ul>
RAID Storage(Data)	8	Depending on HDD-/SSD-drives Single drives or raids possible
Storage(cache)	1	256GB Samsung PM851 SATA-6 SSD
Storage(OS)	1	256GB Samsung PM851 SATA-6 SSD
Power Supply	1	Enermax MaxRevo 1500W

### Mechanical

Component	Description
Height	18" (458mm)
Width	13" (332mm)
Depth	16.3" (415mm)
Gross Weight	48 lbs

### Power

Input	Comments
115 - 240 VAC, 17-10A, (50 - 60 Hz)	The sysGen devCube power consumption can reach 1350W (ambient temperature 30° C) with all system resources under a heavy load. Be aware of your electrical source's power capability to avoid overloading the circuit.



## Connector Ports

Type	Qty	Description
DisplayPort		1 per GeForce TITAN X card
HDMI		1 per GeForce TITAN X card
Ethernet	2	RJ45 LAN port 1 Gbps
Audio	8	Mini stereo jack audio output
Audio	1	Optical S/PDIF output
USB	12	USB 3.0
	2	USB 2.0
eSATA	2	6 Gbps eSATA port

## Lan Port Indicator

LEDs on each ethernet port indicate the connection status as described in the following tables.

Activity/Link LED	
Status	Description
Off	No link
Orange	Linked
Orange (blinking)	Data activity
Orange (blinking then steady)	Ready to wake

Speed LED	
Status	Description
Off	10 Mbps connection
Orange	100 Mbps connection
Green	1 Gbps connection

