# PRODUCT BRIEF

Lanner LEC-2290E

NVIDIA® NGC™-Ready Server

## Lanner

# Reliable, Powerful NGC-Ready Edge AI
## Low-latency Edge AI Solution Featuring GPU-Accelerated Computing

## Lanner and NVIDIA create edge platform for AI inference & Video

**Advanced AI applications now face fundamental challenges in latency, reliability & solution delivery, accessible edge AI systems that can be deployed with existing core IT infrastructure are now key AI enablers**

The accelerating deployment of powerful AI solutions in competitive markets has evolved hardware requirements down to the very edge of our networks. Harnessing existing IT workflows is instrumental to edge-ready solutions capable of closing complex gaps between core business IT investments, competencies and upcoming AI opportunities.

Designed and built in-house by Lanner for secure remote operation and accelerated workloads with the Tesla T4 Tensor core GPU, the LEC-2290E is validated and edge-ready out-of-the-box for streamlined NGC deployments. NVIDIA GPU CLOUD (NGC) fast-tracks edge AI solutions with its comprehensive catalog of containerized software GPU-optimized for edge-to-core solutions.

## Lanner

### NVIDIA T4 GPU Performance

| | |
|---|---|
| Single-Precision: | **8.1 TFLOPS** |
| Mixed-Precision: (FP16/FP32) | **65 TFLOPS** |
| INT8: | **130 TOPS** |
| INT4: | **260 TOPS** |

### Key product benefits

- Purpose-built AI hardware
- NGC-Ready Edge Appliance
- Cloud native software stack
- Highly scalable
- Built-in security
- Performance optimized

| Programmability | Low Latency | Accuracy | Network Size | Throughput | Efficiency | Rate of Learning |
|---|---|---|---|---|---|---|

*Raw throughput is just one of seven factors to consider in the overall evaluation of a system.*
*To get a complete picture of its performance you must take into account all of the above.*

# Reliable Intelligence from the edge, Scalable deployment from the Core

Data center-class deep learning, machine learning, and high-performance compute technologies from edge-to-core using Docker containers for powerful and easy-to-deploy IT infrastructure that scales any edge deployment
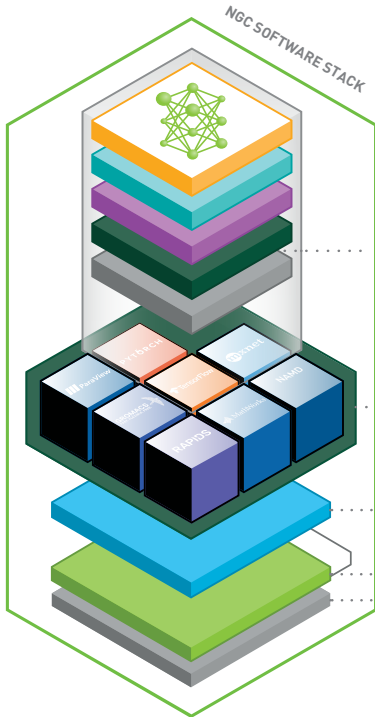
## NGC-Ready Supported Software Highlights

NGC SOFTWARE STACK

PRETRAINED MODELS

DEEP LEARNING
MACHINE LEARNING
HPC APPLICATION
CONTAINERS

CONTAINER RUNTIME

NVIDIADRIVER

HOST OS

**CUDA** is a parallel computing platform and programming model that enables dramatic increases in computing performance by harnessing the power of the NVIDIA GPUs.

NVIDIA CUDA

**DeepStream SDK** delivers a complete streaming analytics toolkit for AI based video and image understanding and multi-sensor processing.

NVIDIA DEEPSTREAM

**NVIDIA TensorRT** is a C++ library that facilitates high-performance inference on NVIDIA graphics processing units (GPUs).
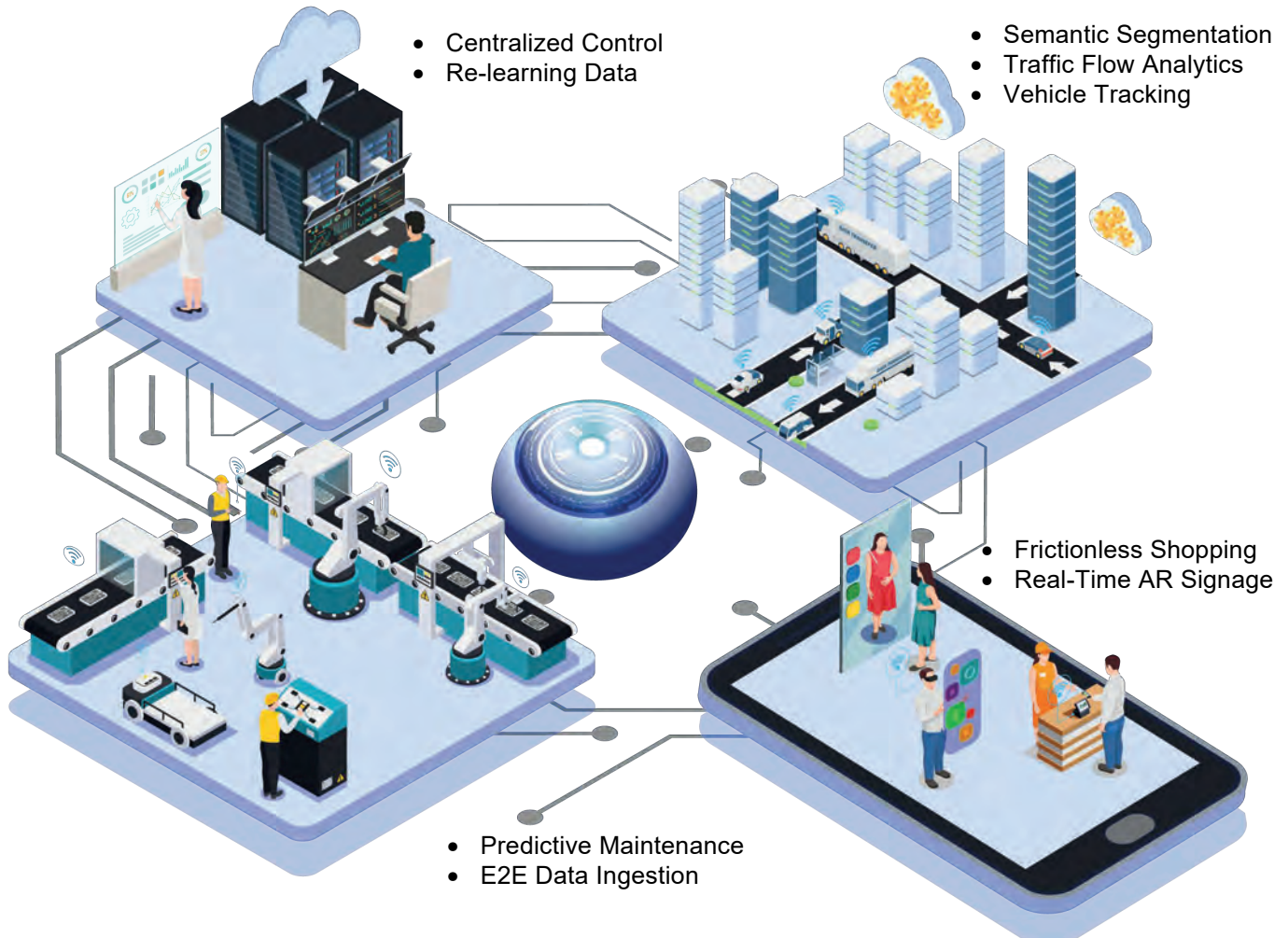
NVIDIA TENSORRT

**TensorFlow** is an open-source software library for high-performance    numerical computation. Its    flexible architecture allows flexible,  easy deployment.

TensorFlow

KALDI

mxnet

RAPIDS

PyTorch

NVIDIA NVCAFFE

NVIDIA TRITON INFERENCE SERVER

From increasingly autonomous manufacturing, to smarter roads and retail outlets, scalable HPC inference opens the floodgates to the litany of disruptive AI:

- Centralized Control
- Re-learning Data

- Semantic Segmentation
- Traffic Flow Analytics
- Vehicle Tracking

- Frictionless Shopping
- Real-Time AR Signage

- Predictive Maintenance
- E2E Data Ingestion

# Lanner 2290E Targeted Application Segments: Retail, Manufacturing, Smart Cities

From 2020-2025 AI is expected to grow by 25 billion in retail, manufacturing, and smart cities, with the demand for better, faster AI edge processing at its highest point. Below are examples of how an NGC- ready system can be utilized within these industries to bring cost-effective optimizations and valuable insights for today.



## Intelligent Retail

With AI-enabled intelligent stores, retailers are reducing shrinkage, eliminating stockout, and gaining visibility into in-store customer behavior to optimize merchandising. These stores leverage data from cameras and sensors to provide valuable analytics that enable smart decision-making, improve operations, and increase efficiency. Additionally, the same infrastructure can be used for a faster customer checkout experience, including fully automated checkout systems.

**Application Segments:** In-store analytics, autonomous shopping, asset protection, customer experience

## Efficient Manufacturing

The flexibility of automation and fast-paced technologies like 3D printing and ecommerce have greatly increased capabilities & diversity, along with overall complexity for manufacturers. To meet these demands manufacturers are relying on powerful AI to increase efficiency and improve logistics.

Cutting edge AI implementations have enabled some of the largest manufacturers to manage the immense influx of millions of parts around the world every day. Machine vision driven robotics have optimized manufacturing of increasingly intricate and personalized products.

**Application Segments:** Manufacturing & logistics





## Smart Cities

Populous cities are deploying powerful autonomous AI solutions to reduce expenditure and increase revenue streams.

Problems like vehicle-tax collection on such scales require machine vision AI solutions that can handle traffic monitoring and vehicle/license plate recognition. Rising public safety concerns with the ongoing pandemic have accelerated the creation and real-world deployment of crowd and safety equipment detection solutions.

**Application Segments:** Traffic control, crowd detection

# LEC-2290E

## ■ Hardware Configuration

- Intel® i7 8700 6C/12T
- NVIDIA T4 Tensor Core GPU for AI acceleration
- 64GB Wide temp SODIMM, 128Gb mSATA and 2.5" 256Gb SATA
- TPM 2.0 and IPMI modules
- 270W AC to DC adapter
- GPU Thermal Kit

## ■ Specifications

**System Processor**

| | |
|---|---|
| CPU Support (FCLGA1152) | Intel®Xeon™ E-2278GEL |
| | Core™ i7-8700(T), i5-8500, i3-8100 |
| | Core™ i7-8700 |
| BIOS | AMI 256Mbit SPI Flash |
| Chipset | BIOS FH82C246 |

**Memory**

| | |
|---|---|
| Technology | DDR4 2133/2400 SO-DIMM |
| Capacity | 2x32GB Wide temp (64GB Max) |
| Socket | 2x 260-pin SO-DIMM |

**Graphic**

| | |
|---|---|
| Controller | Intel® UHD Graphics 630 |
| HDMI | 2 |

**Audio**

| | |
|---|---|
| Codec | TSI 92HD73C |
| Interface | 1x Mic-in, 1x Line-out |

**Ethernet**

| | |
|---|---|
| Controller | Intel i210IT |
| Speed | 10/100/1000 Mbps |
| Interface | 2x GbE RJ45, 4x PoE RJ45 @IEEE 802.3at (Total PoE Budget of 60W) |

**Storage**

| | |
|---|---|
| Type(s) | SATA |
| Expansion | 2x Removable HDD/SSD External Slot w/ RAID |

**I/O**

| | |
|---|---|
| Serial Port | 6x D-Sub RS232/422/485 |
| Digital I/O | 8x DI, 8x DO (12V@100mA) |
| USB 2.0 | - |
| USB 3.0 | 4x Type A |
| Power-On/Reset Button | 1x Power-On, 1x Reset Button |
| Remote Power Switch | 1x 2-pin Remote Power Switch |
| LED | Power/Storage/LTE/Wifi |

**Mechanical**

| | |
|---|---|
| Dimension (W x H x D) | 275 x 115 x 225 mm |
| Construction | Aluminum Extrusion & SGCC |
| Mounting | Wallmount |

**Tesla T4 Tensor Core GPU**

| | |
|---|---|
| GPU Architecture | NVIDIA Turing |
| NVIDIA Turing Tensor | 320 |
| NVIDIA CUDA® Cores | 2,560 |
| GPU Memory | 16 GB GDDR6, 300 GB/sec |
| ECC | Yes |
| Interconnect Bandwidth | 32 GB/sec |
| System Interface | x16 PCIe Gen3 |
| Thermal Solution | Passive |
| Power | 70W |
| Compute APIs | CUDA, NVIDIA TensorRT™, ONNX |

**Expansion Interface**

| | |
|---|---|
| Mini-PCIe | 1x Mini-PCIe (PCIe + USB2.0) w/ Nano-SIM |
| PCIe | 1x PCIe *16 (In Use) |
| M.2 | 1x B Key M.2 w/ Nano-SIM |

**Misc**

| | |
|---|---|
| Watchdog Timer | Yes |
| TPM | TPM 2.0 |
| IPMI | Yes |

**Power**

| | |
|---|---|
| Power Type | ATX |
| Power Supply Voltage | 9~30 $V_{DC}$ |
| Connector | 1x 4-pin Terminal Block |

**Environment**

| Operating Temperatures | | |
|---|---|---|
| | -20°C~45°C | Intel® Core™ i7-8700(3.2GHz)@TDP 65W Intel® Core™ i5-8500(3.3GHz)@TDP 62W Intel® Core™ i3-8300(3.7GHz)@TDP 62W |
| | -20°C ~ 55°C | Intel® Core™ i7-8700T(2.4GHz)@TDP 35W Intel® Core™ i5-8500T(2.7GHz)@TDP 35W Intel® Core™ i3-8100(3.1GHz)@TDP 35W Intel®Xeon™ E-2278GEL @TDP 35W |

(0°C~35°C is recommended to avoid Tesla T4 thermal throttling and maintain compliance with NVIDIA® warranty policy)

| | |
|---|---|
| Storage Temperature | -40°C~70°C |
| Relative Humidity | 10%~90% (Non-condensing) |
| Vibration | IEC 60068-2-64, 0.5Grms, random 5 ~500 Hz, 40 mins/axis |

# Built-in hardware security and manageability

Hardware security is a major concern in edge deployment scenarios, with hardware-enhanced security being the gold-standard for professional-grade edge solutions. The LEC-2290E uses an Intel Core i7 or Xeon CPU, bringing numerous security enhancing and accelerating features. On-board TPM 2.0 for security and IPMI module for Manageability.

**Intelligent Platform Management Interface (IPMI):** IPMI offers system administrators to manage and monitor computing platforms with standardized interface and protocol. Due to its messaging and hardware-based nature, IPMI works independently from the operating system, so that system administrators are able to remotely manage and monitor computing platform status.

**Trusted Platform Module (TPM):** The TPM is a secure crypto-processor that assist with functions such as generating, storing and limiting the use of cryptographic keys. Keys generated by this crypto-processor provide tamper resistance at the hardware-level.

# Performance and power efficiency at the very edge

NVIDIA T4 enterprise GPUs supercharge the world's most trusted mainstream servers. Its low-profile, 70-watt (W) design is powered by NVIDIA Turing™ Tensor Cores, delivering revolutionary multi-precision performance to accelerate a wide range of modern applications, including machine learning, deep learning, and virtual desktops.

**Small-form-factor, 70-watt (W) GPU design:** NVIDIA T4 optimized for scale-out servers, providing an incredible 50X higher energy efficiency compared to CPUs, drastically reducing operational costs. In the last two years, NVIDIA's inference platform has increased efficiency by over 10X, and it remains the most energy-efficient solution for distributed AI training and inference.

**Data center class edge GPU:** The T4 is an ideal universal accelerator for distributed edge computing environments. Revolutionary multi-precision performance accelerates deep learning and machine learning training and inference, video transcoding, and virtual desktops. NVIDIA T4 supports all AI frameworks and network types, delivering dramatic performance and efficiency that maximize the utility of at-scale deployments.

## About Lanner

Founded in 1986, Lanner is an ISO 9001 accredited organization with headquarters in Taipei, Taiwan, and offices in USA, Canada, and China. With over 30 years of experience in system and board hardware engineering, Lanner provides high-performance, reliable, and cost-effective computing platforms. Lanner is most renowned for its range of Intel architecture-based and RISC network appliances.

Lanner Electronics Inc. (TAIEX 6245) provides design, engineering, and manufacturing services for advanced network appliances and rugged applied computing platforms for system integrators, service providers, and application developers.

More information available at www.lanner-america.com.