Cellplus Korea

AI data solution @ Edge computing

ABOUT US

Cellplus Korea is a rising corporate within the IT industry. Backed by cutting-edge engineers and professionals, we provide multifarious hardware, software, and engineering services in order to provide AI & Automotive businesses with high-end solutions to reach their highest potential.

Our MPG V1.5 and MPG V2 have been registered Korea (National) Certification under the 'Clause 3, Article 58-2 of Korean Radio Waves Act' through rigorous examination.

BUSINESS MODELS

[**Own Branded Edge Computing**]

Cellplus's own branded Edge Computing is used in autonomous industry mainly and nowadays it is expanding its realm up to the industry 4.0 as well.

[**AI Sensor Data Acquisition & Processing Service**]

Providing AI sensor data acquisition & processing according to clients' demanding including verification & validation services of sensor fusion.

KEY COMPETENCIES

Engineering Service

Providing development services of H/W, S/W for AI Algorithms, Camera ISP, AI sensor data acquisition, V&V and sensor fusion solutions.

Maintenance, Technical Sales and Others.

Providing maintenance services after edge computing development distributing AI solutions and CE for clients.

Hardware Design
- FPGA, Chip
- AI sensor data acquisition equipment
- Design low power consumption H/W

Development of Software & App
- O/S, MCU/SP
- Management tools, UI for users
- Solutions for data verification

System Design
- Design for various interface board
- Design of sensor interface
- Development, porting, tunning of camera ISP

Cloud & AI Data Acquisition
- AWS, AZURE
- Validation & verification for AI sensor data in autonomous car
- Remote monitoring system for Autonomous via WebRTC

01

Covering interface of many types of sensors management

Covering interface of many types of sensors management

02

Pull-path for AI sensor data management

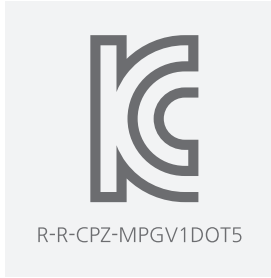Logging, Storage, HILS, Data management, Data acquisition, Processing, etc.

03

Deep learning & AI Algorithms on edge

Development of products & services Based on customers' demands

Cellplus Korea
AI data solution @ Edge computing

Monitoring

5G+ WebRTC

Cloud Computing
5G+, AWS, AZURE

Data Center

Autonomous
- 5G+, WebRTC
- Remote Monitoring

NVIDIA
Jetson Xavier

ECU

V&V

MPG

GPS/DGPS/IMU

IMU

LiDAR

RADAR

C-CAN

CAMERA

ULTRASONIC

AI Sensor Data
- Synchronization
- Sensor Fusion

Edge Computing
- DAQ & AI Algorithms
- Pre-processing & ML

V&V
- Replay & HILS
- Multi-channel Splitter

MPG V1.5

MPG V1.5

for
ADAS/AD Logging,
remote monitoring,
data center and others,
as edge computing

R-R-CPZ-MPGV1DOT5

What is

- The ADAS logging platform, MPG V1.5 is especially designed for the data acquisition
  of High-bandwidth camera interfacing(MPI), ECUs etc.
- The platform with 6 Gbit/s acquisition rate combined with SSD add-on.
  It provides up to 4 TByte of logging storage.
  And MPG V1.5 supports USB 3.1, 10 Gbit/s Ethernet and 2 of CAN-FD
  Due to the compact rack-setup, which is optimized for small space in the vehicle,
  you can install it and back your data up conveniently.

Highlights

- Portable & Compact : Store huge amounts of data into the portable SSD card
- High-performance : Real time storage of the images from the 4-Channel camera
- Ultra-stable : Stable power supply without interruption in a moving, shaking vehicle
- Power-efficiency : Stable operation by ultra-low power (45W)
- Customizable : Various options based on add-on boards
                 Customized software development available

Applications

- Autonomous vehicles (Edge computing for logging system)
  - Pre-procecssing equipment on pictures-optimization for autonomous vehicles
  - Data acquisition to develop the AI algorithms for the autonomous vehicles
- Autonomous drones (logging system)
- Safety control systems of smart factory
- Security systems of smart city (via CCTV) and others

Technical Details

SOM	Nvidia Jetson™ Xavier	
GPU	512-Core GPU Tensor Cores Vulkan™ 1.0 CUDA® 10	
CPU	ARMv8.2 (64-Bit) heterogeneous multi-processing (HMP) 4x Dual-Core CPU clusters (8 NVIDIA Carmel processor cores) L3 Cache: 4 MB (shared across all clusters)	
Memory	256-Bit DRAM interface Secure External Memory Access Using Trust Zone Technology Memory Type: LPDDR4x Memory Size: 32GB Maximum Memory Bus Frequency : 2133 MHz	
Input Power	19V	
Interface	SSD	6 Gbit/s SATA3 X 1EA * 4 TB SATA3 available (Add-on option / built-in SSD card slot)
	Ethernet	1 Gbit/s Ethernet X 1EA 10 Gbit/s Ethernet X 1EA
	USB	USB 2.0 X 1EA USB 3.0 X 1EA USB 3.1 X 2EA (xHCI host controller with integrated PHY)
	CAN	CAN-FD X 2EA (up to 5Mbit/s)
	GPS	GPS UART communication / receiver X 1EA
	HDMI	Maximum Resolution 3840 X 2160 at 60Hz
	Camera	MIPI Rx 4-Channel (Add-on option)
Networking	10/100/1000 BASE-T Ethernet Media Access Controller (MAC) / RGMII Interface Standards-compliant 10G BASE-T Pcle 3.0 Ethernet	
Dimension	252 X 135 X 67 (mm)	

Variants (Options)	• Add-on : MPI Board
	   - Deserializer high-speed 2-Channel 2M 30FPS, high-resolution solutions
	   - Up to 6 Gbps Serial-Bit Rate GMSL2 mode
	   - Deserializer Low-speed 4-Channel 1M 30FPS, low-resolution solutions
	   - Up to 1.74 Gbps Serial-Bit Rate GMSL1 mode
	   - Support MIPI-CSI2
	• Add-on : SSD Storage Card
	   - SATA interface SSD card slot
	   - 4TByte SSD card(6 hours recording @1M Pixel Camera 4EA)
	• Customization
	   - It can be modified according to each customer's requirements	

MPG V2

MPG V2

for
ADAS/AD Logging,
remote monitoring,
data center and others,
as edge computing

R-R-CPZ-MPGV1DOT5

What is

- The ADAS logging platform, MPG V2 is especially designed for the data acquisition
  of High-bandwidth camera interfacing(MPI), ECUs etc.
- The platform with 3,800 MB/s acquisition rate combined with built-in SSD.
  It provides up to 15 TByte of logging storage.
  And MPG V2 supports USB 3.1, 10 Gbit/s Ethernet and 2 of CAN-FD
  Due to the compact rack-setup, which is optimized for small space in the vehicle,
  you can install it and back your data up conveniently.

Highlights

- Portable & Compact : Store huge amounts of data into the portable SSD card
- High-performance : Real time storage of the images from the 4-Channel camera
- Ultra-stable : Stable power supply without interruption in a moving, shaking vehicle
- Power-efficiency : Stable operation by low power (85W)
- Customizable : Various options based on add-on boards
  Customized software development available

Applications

- Autonomous vehicles (Edge computing for logging system)
  - Pre-procecssing equipment on pictures-optimization for autonomous vehicles
  - Data acquisition to develop the AI algorithms for the autonomous vehicles
- Autonomous drones (logging system)
- Safety control systems of smart factory
- Security systems of smart city (via CCTV) and others

Technical Details

SOM	Nvidia Jetson™ Xavier	
GPU	512-Core GPU Tensor Cores Vulkan™ 1.0 CUDA® 10	
CPU	ARMv8.2 (64-Bit) heterogeneous multi-processing (HMP) 4x Dual-Core CPU clusters (8 NVIDIA Carmel processor cores) L3 Cache: 4 MB (shared across all clusters)	
Memory	256-Bit DRAM interface Secure External Memory Access Using Trust Zone Technology Memory Type: LPDDR4x Memory Size: 32 GB or 64 GB Maximum Memory Bus Frequency : 2133 MHz	
Input Power	19V	
Interface	U.2	PCIe Gen4 x4 * 15 TB available built-in SSD
	Ethernet	1 Gbit/s Ethernet X 1EA 10 Gbit/s Ethernet X 1EA
	USB	USB 2.0 X 1EA USB 3.0 X 1EA USB 3.1 X 2EA (xHCI host controller with integrated PHY)
	CAN	CAN-FD X 2EA (up to 5Mbit/s)
	GPS	GPS UART communication / receiver X 1EA
	HDMI	Maximum Resolution 3840 X 2160 at 60Hz
	Camera	MIPI Rx 4-Channel (Add-on option)
Networking	10/100/1000 BASE-T Ethernet Media Access Controller (MAC) / RGMII Interface Standards-compliant 10G BASE-T Pcle 3.0 Ethernet	
Dimension	252 X 136 X 137 (mm)	

Variants
(Options)
	• Add-on : MPI Board
	  - Deserializer high-speed 2-Channel 2M 30FPS, high-resolution solutions
	  - Up to 6 Gbps Serial-Bit Rate GMSL2 mode
	  - Deserializer Low-speed 4-Channel 1M 30FPS, low-resolution solutions
	  - Up to 1.74 Gbps Serial-Bit Rate GMSL1 mode
	  - Support MIPI-CSI2
	• Built-in SSD Storage
	  - 15 Tbyte SSD card (24 hours recording @1M Pixel Camera 4EA)
	• Customization
	  It can be modified according to each customer's requirements	

MPH V1
for ADAS/AD Cameras, as HILS Solution.
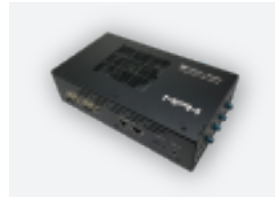
What is
- The MPH V1 is an ADAS HIL simulation solution for electrical emulation of 4-Channel sensors and actuators. The MPH V1 consists of a SerDes interfacing to main ECU, a signal generator programmed in FPGA and a USB bridge controller interfacing to main SoC.
- The SoC of MPH is Nvidia Jetson Xavier with AWS IoT Greengrass, which builds and trains the machine learning models quickly and easily. Also, it deploys them into a production-ready hosted environment directly.

Highlights
- Super speedy Interface : Quick preview available by USB 3.0
- High-performance system : Carmel CPU complex connected
- High-Speed data serialization for megapixel camera : CAN, CAN FD supported
- Excellent synchronizing output data : Programmed in FPGA

Applications
- Autonomous vehicles
- Portable HIL simulators for testing of engine ECUs

Technical Details

SOM	Nvidia Jetson™ Xavier	
CPU	ARMv8.2 (64-Bit) heterogeneous multi-processing (HMP) 4x Dual-Core CPU clusters (8 NVIDIA Carmel processor cores) connected L3 Cache: 4 MB (shared across all clusters)	
Memory	Memory Type : LPDDR4x	
Input Power	19V (USB power)	
Interface	CAN	CAN-FD X 2EA(up to 5 Mbit/s)
	USB	USB 3.0 Super Speed
	Ethernet	1 Gbit/s Ethernet X 1EA
		10 Gbit/s Ethernet X 1EA
	DATA-OUT	GMSL X4 Coax Type Output (Up to 1.74 Gbps Serial-Bit Rate GMSL mode)
Dimension	252 X 135 X 67 (mm)	
Camera HILs	Clock	98MHz (Maximum)
	Resolution	Maximum 1280 X 960, 30 FPS, 12-Bit
	Pixel Format	YUV422 8-Bit (UYVY) or Bayer 12-Bit

Requirements Specification

Supported O/S : Ubuntu 18.04 / 8-core ARMv8.2 64-Bit / 8GB RAM
USB 3.0 Interface, USB 2.0 Interface / SSD Hard Disk Drive (512GB and over)

MPS (4L-8C)
Synchronizing 4-Channel splitter for SIL

What is
- MPS-4L-8C is an ADAS SIL system serving a splitter solution with analysis of the original & result images.
- The MPS-4L-8C is consists of a SerDes interfacing to main ECU and the MPG device of Cellplus Korea

Highlights
- Super speedy interface
  - Splitting the acquired data into the 8-Channel output units
- Excellent synchronizing
  - Synchronizing logger for 4-Channel camera & 8-Channel splitter
  - Synchronizing of input data (YUV) from 4-Channel
  - Synchronizing of output data (YUV) into 8-Channel

Applications
- Algorithm Verification

Technical Details

Input Power	12V / 8.4W / PoC 6.5V	
Interface	Sensor	FPGA-based converter sensor (Converting parallel YUV data into MIPI YUV data)
	DATA - IN	Parallel Interface (up to 1.74Gbps Serial-Bit Rate) MAX96706(GMSL) X 4 Coax type
	DATA - OUT	Up to 8-Channel output available MAX96705(GMSL) X 8 Coax type
	Image Resolution	Maximum 1280 X 960 Resolution 30 FPS
Dimension	146 X 102 X 43 (mm)	

MPI Series
Interface for SVM 4-Channel camera logger (Add-on Board)

What is
- MPI Series (a logging module based on GMSL, FPD-LINK) converts the data from multi-channel sensors into the MIPI YUV and Bayer data. And it puts the data into the logging module(Nvidia Jetson™ Xavier) synchronously.
- The mega-pixel CMOS image sensor interfaced into the MPI board and Nvidia Jetson™ Xavier AGX of MPI board receives the MIPI CSI-2. Also, Nvidia Jetson™ Xavier AGX supports the GMSL1 and GMSL2 through the PoC(Power over Cable) which shares the power and data at once by the identical cable.

Highlights
- High-Performance : Parallel-to-MIPI converter inside / MIPI splitter and transmitter inside
- Super speedy interface : Optimized to 4-Channel megapixel camera data
- Excellent synchronizing : Synchronous logging of the input data from each sensor (up to 4-Channel Camera)

Series
- MPI-1L-4C-M
- MPI-1L-5C-M
- MPI-2L-2C-M
- MPI-4L-4C
- MPI-4L-4C-FP

	MPI		MPG
COAX		MIPI	
			Logging Processor Module
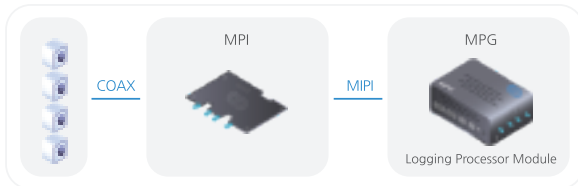
Technical Details

Interface	Sensor	Converting the parallel data into the MIPI data
	DATA 1 (MPI-4L-4C, MPI-4L-4C-FP)	IN : Parallel Interface OUT : MIPI(Mobile Industry Processor Interface) GMSL1, FPD-LINK III Deserializer
	DATA 2 (MPI-1L-4C-M, MPI-1L-5C-M, MPI-2L-2C-M)	IN : MIPI Interface (YUV or Bayer) OUT : MIPI(Mobile Industry Processor Interface) GMSL2 Coax splitter signal
	Camera Resolution	1M, 4-Channel, 30 FPS 2M, 2-Channel, 30 FPS 4M, 2-Channel, 30 FPS

SPH (4L-4C)
Smart portable HILS 4-Channel for ADAS/AD camera

What is
- The SPH is an ADAS HIL simulation solution for electrical emulation of 4-Channel sensors and actuators. The SPH consists of a SerDes interfacing to main ECU, a signal generator programmed in FPGA and a USB bridge controller interfacing to NAS.
- The USB bridge controller is a Cypress EZ-USB FX3™. It is a SuperSpeed(10x of bandwidth) USB 3.0 peripheral controller that enables developers to add USB 3.0 device functionality to data and it creates high-quality HD images with no needs for compression.

Highlights
- Super speedy interface : Quick preview with FX3 USB 3.0
- High-Speed data serialization for megapixel camera
- Excellent synchronizing output data : Programmed in FPGA

Applications
- Autonomous vehicles & Autonomous drones
  - Portable HILS 4-Channel camera
  - Solution for ADAS/AD camera

Technical Details

Input Power	USB Power	
Interface	USB Port	USB 3.0 Micro-B Capability to any system through adding USB 3.1 Gen 1(5.0 Gbps) Up to 32-Bit, 100MHz, GPIF II(parallel General Programmable interface)
	DATA-OUT	GMSL X 4 Coax type output
	Resolution	Maximum 1280 X 960, 30FPS, 12-Bit
	Pixel Format	YUV422 8-Bit (UYVY) or Output Bayer 12-Bit
Dimension	146 X 95 X 55 (mm)	

SPH-PCIe (4L-4C)
Smart Portable HILS 4-Channel Camera with PCI Express

What is
- The SPH-PCIe is an ADAS HIL simulation solution for electrical emulation of
  4-Channel sensors and actuators. The SPH-PCIe consists of a SerDes,
  a signal generator programmed in FPGA and a PCI Express connected to the computer.
- SPH-PCIe is the world's first to implement simultaneous output of 4 UHD-cameras.
  It is a Windows PC-based simulator equipment for
  the 4-channel 8M cameras-acquired and ultra-high-capacity images.
- PCI Express (based on x8 lane, PCIe Gen 3) supports a transfer rate of +8GT/s per lane and
  throughput of +7GB/s. It allows developers to simulate their algorithms on Windows-based
  PCs, and it provides the high-resolution images with no need for compression.

Highlights
- Super Speedy Interface : Quick preview available with Window PC
- High-Speed data serialization for 8 megapixel camera : UHD class resolution
- Excellent synchronizing Output Data (up to 4-channel) : Programmed in FPGA

Applications
- Autonomous Vehicles / Autonomous Drones
  - Portable HILS 4-Channel camera
  - Solution for ADAS/AD camera
  - Windows-based simulation on PC

Technical Details

Input Power	12V (Power Supply)	
Interface	PCI Express	Based on x8 lane, PCIe Gen3 Transfer Rate per lane : +8GT/s Throughput : +7GB/s
	DATA-OUT	MAX96717(GMSL) X 4 Coax type output 3Gbps or 6Gbps Serial-Bit Rate
	Resolution	Maximum 8 mega pixel, 30FPS
	Pixel Format	YUV422 or 12-Bit Bayer / Output Bayer 12-Bit
Dimension	200 X 120 X 20 (mm)	

PSM V1
Power Supply for Mobility

What is
- The PSM V1 is a power supply device by remote control. To let it work, we need only
  a basically built-in adapter in a vehicle such as a cigarette lighter. It carries electric
  power from a cigarette lighter adapter to an in-vehicle testing equipment.
- Our PSM device supplies very stable power to various equipment including the ECU.
  Power on & off is operated by in-vehicle PC connected to PSM by the RS-232 controller.

Highlights
- Ultra-convenient operation : Quick & Easy connecting by RS-232 remote control
- Smart transformation : Electric power of 220V can be transformed to 24V power
  (up to 120W power supply) the most stable operating is under the condition of 12V(5A)
- Two-ways converting available : Step-down & Step-up convertor
- Smart control
  - Adjustable & regulated power supply
  - Adjustable buck-boost converter
  - Automatic temperature adjustment(cooler function) through its active temperature sensor

Applications
- Power supply for mobility platform
- Power supply for remote control system

Technical Details

General	Support 0V to 24V
	Max. 120W (Normal : 12V, 5A / Max. 24V, 5A)
	3-Channel constant power / 3-Channel remote control power
Input Power (in vehicle)	DC 12V by built-in cigarette lighter adapter or AC 220V by built-in power socket
Terminal Socket	Keeping plugged-in at using remote control mode 12V(5A) @ RS232 socket
Network	RS-232 remote control (USB to RS-232) Female type D-SUB 9pin connector (D-SUB 9pin male cable)
	UART　　9600 Baud 　　　　　- Protocol 'A' : Power off 　　　　　- Protocol 'a' : Power on
Dimension	210 X 220 X 75 (mm)

UPCOMING PRODUCTS IN 2023

HVD
Hybrid IR & Night Vision Detector

HVD, Hybrid Infrared ray & Night Vision Detector for vehicles,is a device for preventing sudden accidents caused by people, animals, objects, or potholes on the road while driving. Not only clear weather but also bad weather conditions such as night, pouring rain, heavy snow, and sandstorms, HVD recognizes the front objects.
HVD also notifies the driver or autonomous driving system immediately if there is a dangerous situation.
Unlike existing far-infrared sensor products, HVD can be mounted inside the car, which makes it easy to mount on any vehicle with any appearance.

RADAR

LiDAR

LSAV
Logging System for Autonomous Vehicles

LSAV, logging system for autonomous vehicles, is especially designed for acquisition of lossless raw data.
It stores UHD high-resolution images in real-time.
Also, it can synchronize and store multi-channel heterogeneous sensors' data(up to 8 sensors available).

MPG

CAMERA

VS-VRAI

Verification & Validation Simulator for Visual Recognition AI Algorithms

VS-VRAI is a verification & validation simulator for vision algorithm developers.

It allows real-time testing with accuracy and stability of the image recognition algorithm under development as testing on an actual vehicle in real-time, even within the laboratory.

VS-VRAI helps the algorithms to be advanced so that the performance and safety of all autonomous vehicles/drones/CCTVs based on image data can be recognized and commercialized.

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We'd Love to Hear From You

whether you're curious about our products, services, ordemonstration.
- we're ready to answer any question.

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