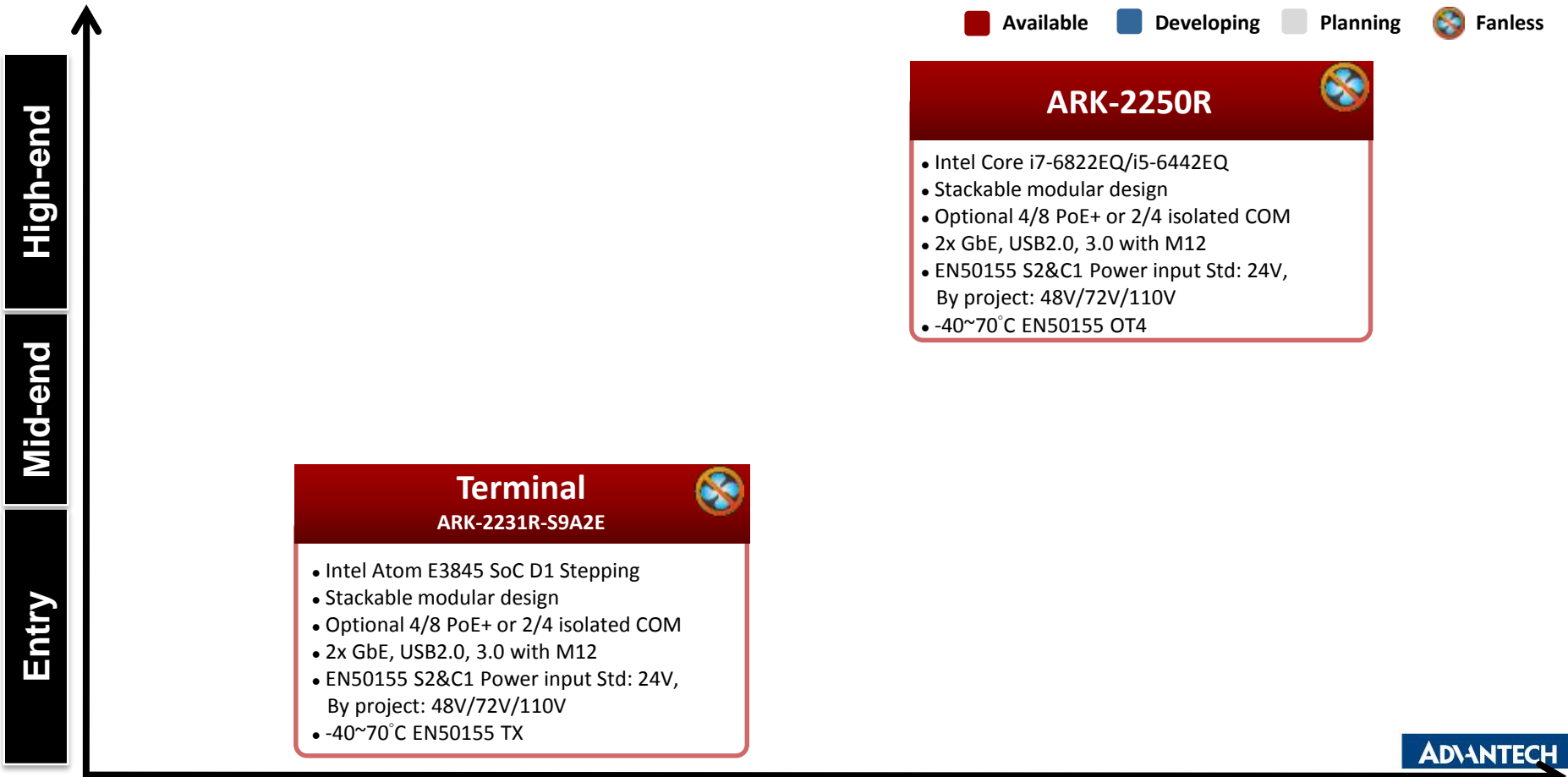




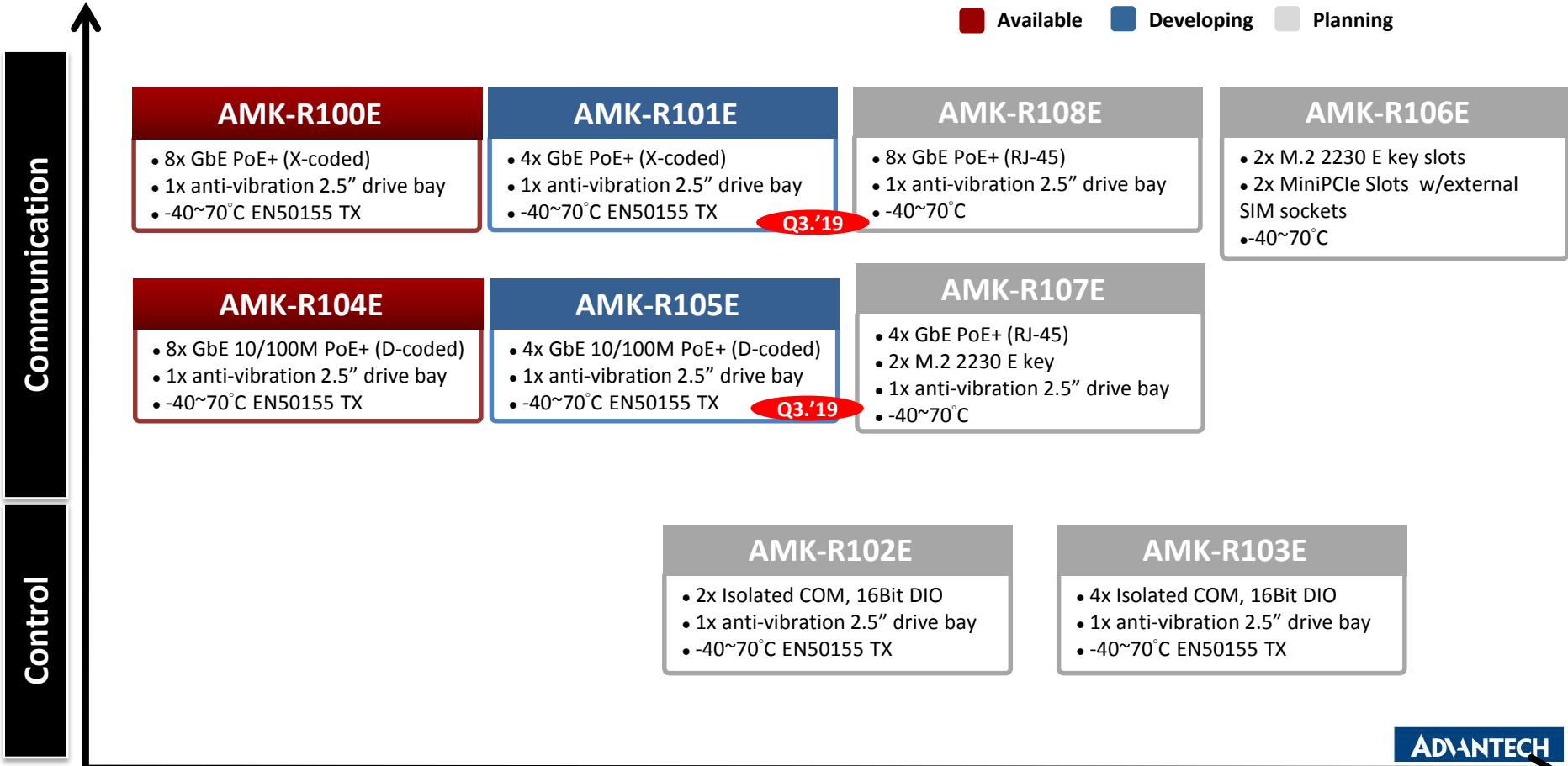
# ARK Rolling Stock System



# ARK-R (Railway, EN50155 certified) Roadmap



# Extension Layers Roadmap



# ARK Rolling Stock Series Target Applications



## Safety Monitoring

Detect abnormal events and forbidden objects to enhance passenger safety



## BYOD Infotainment

Enhance passenger experience by providing entertainment content through mobile devices



## Traveler Information System

Display real-time train schedules for passengers to keep updated of latest information



## Cabin Environment Monitoring

Collect real-time environmental sensor data to detect temperature, smoke, and fire, for safety precautions



## Alarm System

Alarm passengers of emergency situations to enhance safety



# ARK-2250R Compelling Features

EN50155 Certified Fanless Embedded System with stackable extension capabilities

Target for **Rolling Stock, NVR, BYOD & Infotainment**



## Excellent computing/Graphic power

Support up to 1080P @240fps

Intel 6Gen i7-6822EQ 2.0GHz QC, i5-6442EQ 1.9GHz QC

DDR4 Dual Channels, up to 32GB



## Stackable 2<sup>nd</sup> extended layer for specific application

2\*GbE, USB3.0, 2\*USB2.0, VGA, HDMI, Audio, DIO, 2\*COM, 2\*SATA

2<sup>nd</sup> Layer: **NVR, DVR, Date Terminal, Communication**

## Diversity Communication and Sensor

Built-in: **GPS** and **G-Sensor**

1\* Mini-PCIe Slot and 2\* M.2 2230 E key (**WLAN, WWAN, BT**)

## Default DC 24 , EN50155 S2C1

48V, 72V, 110V option by project

2018/Aug

Phase In

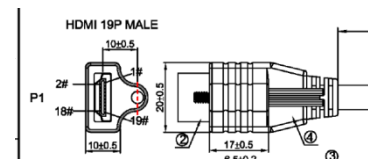
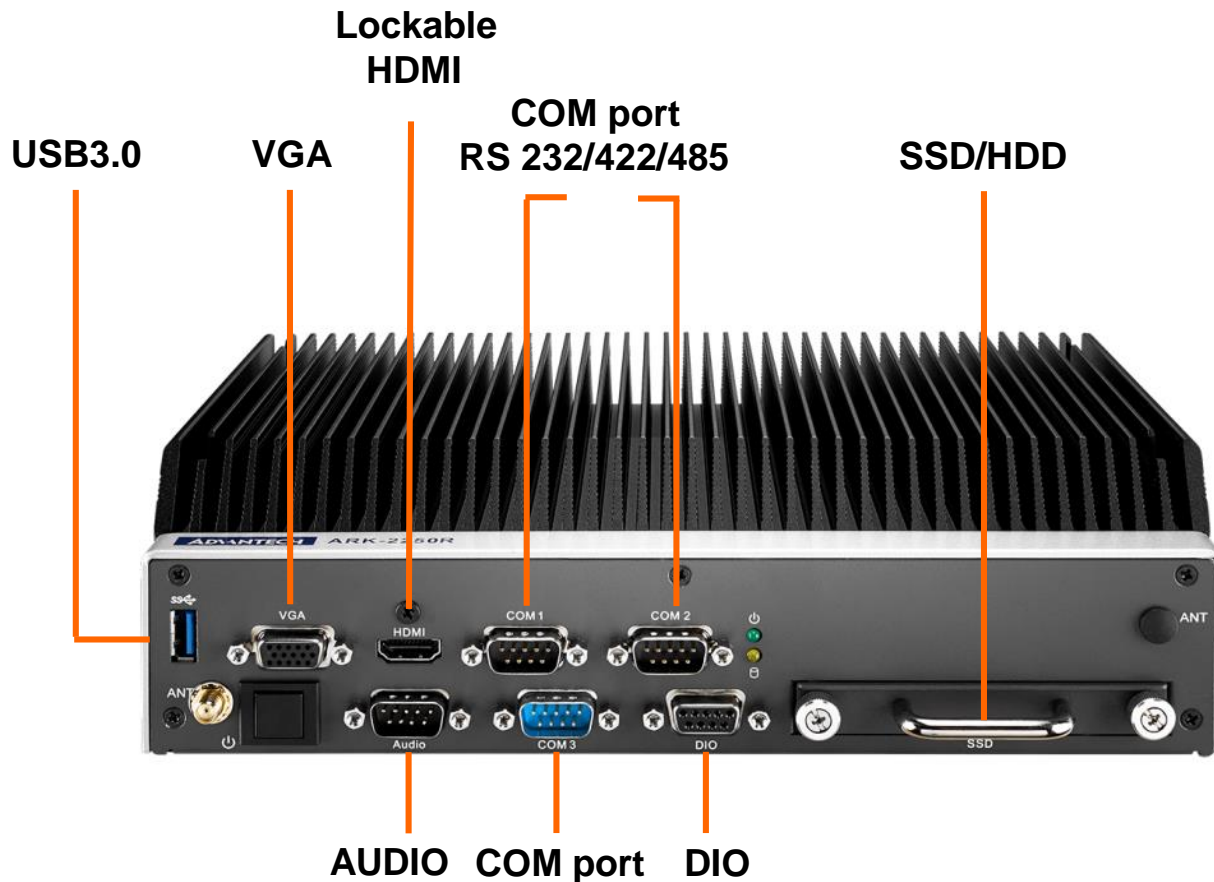
2028/Q4

Longevity

## Certification

CE, FCC Class B, CB, UL, CCC, BSMI, EN50155 ,  
EN50121-3-2, EN50121-4, IEC 61373

# Lockable, Rugged IO Design



1700023855-01 1M  
1700023856-01 3M





# Video Capability



\*Video format: H.264

Model		ARK-2231R	ARK-2250R
			Atom E3845 QC 1.91GHz
Mode	Resolution	Live View + Recording	Live View + Recording + <b>Video Analytics</b>
Live View	SD (640x480)	120FPS (4ch/30fps)	*
	HD (720p)	60FPS (4ch/15fps)	*
	Full-HD (1080p)	30FPS (1ch/30fps or 4ch/7fps)	240FPS (8ch/30fps)
Recording	HD (720p)	120FPS	*
	Full-HD (1080p)	120FPS	240FPS (8ch/30fps)

# Embedded Modular Design

## Embedded modular design



### Stackable extension

- Communication
- Storage extension
- Data acquisition
- ODM



### Railway EN50155 Certification

- EN50121-3-2 (EMC)
- EN50121-4 (EMC)
- EN50155 Tx (-40~70°C)
- IEC 61373 (Shock/Vibration)



### ARK-2231R / 2250R

- Intel® Atom™ / Core™ i platform
- Ruggedized M12 connector design
- -40~70°C EN50155Tx



### AMK-R102E

- 4 x isolation COM
- 16 x isolation DIO



### AMK-R104E

- 8 x 10/100 PoE+
- 1 x 2.5" drive bay



### AMK-R100E

- 8 x GbE PoE+
- 1 x 2.5" drive bay

### Stackable Extension Options

# IEEE 802.3at Compliant

➤ **ARK-2231R, ARK-2250R PoE Power Budget: 60Watt**



## +AMK-R100E/AMK-R101E

- ✓ Giga Mbps
- ✓ 4/8ports M12 X-coded
- ✓ Total 60Watt for 4/8Ports, 30W/port (max)
- ✓ Real-time monitoring/control by individual ports

## +AMK-R104E/AMK-R105E

- ✓ 10/100 Mbps
- ✓ 4/8ports M12 D-coded
- ✓ Total 60Watt for 4/8Ports, 30W/port (max)
- ✓ Real-time monitoring/control by individual ports

# Rolling Stock Power Design

- DC 24V standard, DC 48/72/110V options by project
- Compliant EN50155 S2/C1 Protection Level
  - ✓ S2: Systems keeps working after 10ms power off
  - ✓ C1: DC input x 40% variation during 100 ms (w/o interruptions)
- EN50121-3-2 Compliant

Item	EN50121-3-2	Criteria
Electrostatic Discharge - ESD EN 61000-4-2	± 6KV contact	B
	± 8KV air	B
Radio-frequency Electromagnetic Field Susceptibility - RS EN 61000-4-3	(80 -- 1000MHz) 20V/M, 80% AM, 1KHz	A
Electrical Fast Transient/Burst - EFT EN 61000-4-4	± 2 kV 5/50 ns, 5 kHz	A
Surge Immunity EN 61000-4-5	Line to Ground: +/- 2KV Line to Line: +/- 1KV	B
Conducted Radio Frequency Disturbances - CS EN 61000-4-6	(0.15~80MHz) 10Vrms, 80% AM, 1kHz	A

# Ambient Temperature Resistance

- **EN50155 TX Class Ranging support from -40 to 70°C**
  - ✓ Material selected for extreme temperature

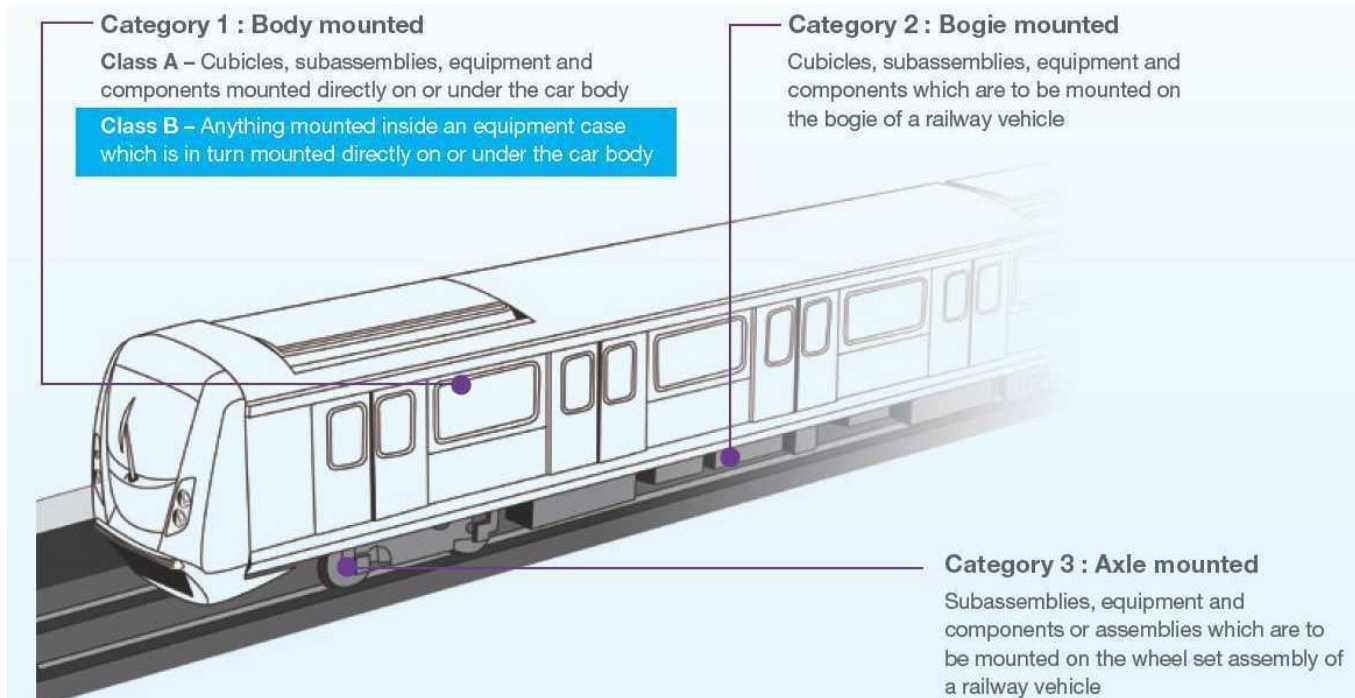
Class	Internal cabinet temperature	Internal cubicle over-temperature during 10 min
T1	-25°C to +55°C	+70°C
T2	-40°C to +55°C	+70°C
T3	-25°C to +70°C	+85°C
<b>TX</b>	<b>-40°C to +70°C</b>	<b>+85°C</b>



# Shock & Vibration Resistance

## ➤ IEC 61373 Category 1, Class B

- ✓ Random vibration: 7.9/3.5/5.5 m/s<sup>2</sup> for X, Y, Z axis (5~150Hz)
- ✓ Shock: 50 m/s at 30ms





# Standard & Regulation For ARK-R Series

## CE, FCC Class B, CB, UL, CCC, BSMI

Standard regulation for Safety and EMC

### EN50155

Electronic equipment  
used on rolling stock  
Temperature: Tx  
Power: S2C1

### EN50121-3-2

EMC. Rolling stock.  
Apparatus

### EN50121-4

EMC. Emission and  
immunity of the  
signaling and  
telecommunications  
apparatus

### IEC61373

Rolling stock  
equipment –  
Shock and  
vibration tests  
Category 1, Class B

# ARK Transportation System Landing Page

ADVANTECH *Pushing an Intelligent Planet*

## Intelligent Transportation Systems

Certified designs for in-vehicle, rolling stock and street applications



## Intelligent Transportation Systems

Advantech provides in-vehicle, rolling stock fanless systems with unique designs for applications in the transportation industry. These products feature in-vehicle/rolling stock certifications (ATEX/EN50155), high extension capability for communication interfaces, wireless 3G/LTE and GPS communication support, and rugged, wide operating temperature designs. With flexible and modular hardware design capability, we efficiently meet customer's function and time-to-market requirements, and enable excellent applications including fleet management, mobile surveillance, passenger information systems, traffic surveillance and management, and much more.



### Certified Design

- Rugged EN50155, EN50121-3-2 certifications
- Various EMC/CE, IEC 737-2 certifications
- Anti-vibration, shock proof and wide temp.



### Diversity Communications

- Multi WLAN/WiMAX connectivity
- GPS, GLONASS, BeiDou & QZSS built-in
- Up to eight 4G LTE ports



### Flexible Integration

- Various vehicle SDK and APIs
- Video management surveillance
- Microsoft Azure, IOT Cloud Solutions

## Application Stories

<p><b>Fleet Tracking System</b> Fleet tracking is extremely important for companies that need to manage vehicles and assets on the move in order to ensure safe and efficient operations.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>RTSoft</b></p>	<p><b>On-board Surveillance</b> The latest advances in surveillance technology has extended applications from traditional fixed point to mobile surveillance.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>Seetlab</b></p>	<p><b>Passenger Information &amp; Entertainment System</b> Public transportation is essential for people to travel from one point to another, be it for vacation or commute purposes.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>Passengevo</b></p>	<p><b>Smart Parking</b> Nowadays, parking lots primarily use locks or tokens to manage the entrance and exit of vehicles into the area.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>Seetlab</b></p>
<p><b>Road Traffic Management System</b> When vehicle accidents occur, law enforcement departments can make use of video records to retraced the incident.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>CSC</b></p>	<p><b>Platform Security</b> Be it train, metro, tram, bus, or coach platforms, security is often overlooked, which results in unfortunate incidents of baggage loss.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>MAGNIX</b> <b>CNCAM</b></p>	<p><b>Street Surveillance</b> Cities around the world require technology solutions that can help law enforcement departments to deal with threats and violence on the streets.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>MAGNIX</b></p>	<p><b>Police Car Surveillance</b> Technology solutions can assist law enforcement agencies during their daily operations of preventing crime and accidents.</p> <p><a href="#">Download</a></p> <p>Partner:  <b>MAGNIX</b></p>

## Product Offerings

### On board systems

In-Vehicle	Rolling Stock
<p><b>ARK-2121V</b> In-vehicle Fanless System, Intel® Atom™ E3825/ E3845 with 4 PoE Ports.</p> <p><a href="#">Buy Now</a></p>	<p><b>ARK-2161V</b> In-vehicle Fanless System, Intel® Core i5-4300U/ Celeron 2800U with 4 PoE Ports.</p> <p><a href="#">Buy Now</a></p>
	<p><b>ARK-2251R</b> EN50155 Rolling Stock Fanless System, Intel® Atom™ E3825/ E3845 with 4 PoE Ports.</p> <p><a href="#">Buy Now</a></p>

### Street NVR systems

Outdoor Surveillance	
<p><b>ARK-2121S</b> Rugged HD NVR with 4 PoE Ports up to 8ch video recording, Intel® Atom™ E3845 QD SOC.</p> <p><a href="#">Buy Now</a></p>	<p><b>ARK-2161S</b> Rugged Full HD NVR with 4 PoE Ports up to 16ch video recording, Intel® Core i5-4300U QD.</p> <p><a href="#">Buy Now</a></p>

### Mobile surveillance solution

In-Vehicle	Rolling Stock
<p><b>Package Content:</b></p> <ul style="list-style-type: none"> <li>• ARK-V systems</li> <li>• IP CAM + 7" touch monitor</li> <li>• Surveillance software</li> </ul> <p><a href="#">Get Quote</a></p>	<p><b>Package Content:</b></p> <ul style="list-style-type: none"> <li>• ARK-R systems</li> <li>• IP CAM</li> <li>• Surveillance software</li> </ul> <p><a href="#">Get Quote</a></p>

Landing page: <http://select.advantech.com/intelligent-transportation-systems/en-us/>

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*Go Together,  
We Go Far and Grow Big*

