

**ADVANTECH**

*Enabling an Intelligent Planet*



## Emerging-Market Focus

# Industrial Wireless Solutions Success Story eBook

9 x Wireless/Boards/Systems Cases

**ADVANTECH**

**AIWireless**

Advantech Industrial Wireless

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EV Charger

AGV/AMR

Drones

Airport

# ADVANTECH AIWireless

Advantech Industrial Wireless



Railways

Tractors

Bikes

Locker

Advantech Industrial Wireless Solutions (AIW) is dedicated to helping customers activate wireless connectivity with comprehensive design-in services. These services cover everything from solution selection to certification acquisition, enabling customers to reduce AIoT time to market.



## Wireless Design-in Services



# Wireless Market Focus and Star Solutions



**WiFi 6**  
 CERTIFIED

**WiFi 6E**  
 CERTIFIED

**GPS** GNSS Compare  
 Research lab in your pocket

**4G LTE** **5G**

**Bluetooth 5.2**

IP55 IP66

## AIW 100 Series



**AIW-163**  
 M.2 2230  
 A-E Key

**AIW-165**  
 M.2 2830  
 E Key

**AIW-168**  
 M.2 2230  
 E Key

## AIW 200 Series



**AIW-210**  
 M.2 2242  
 B Key

**AIW-211**  
 LCC Stamp  
 Type

**AIW-212**  
 HMC

## AIW 300 Series



**AIW-343**  
 FMC/SIM Slot

**AIW-346**  
 M.2 3052  
 Key B/ FMC/  
 SIM Slot

**AIW-355**  
 M.2 3052  
 B Key

## AIW 400 Series



**AIW-450**  
 BT 5.2  
 LGA Type

## RF Antennas & Wireless Service



**EWM-W306S01E**

**AIW Antennas Offerings**



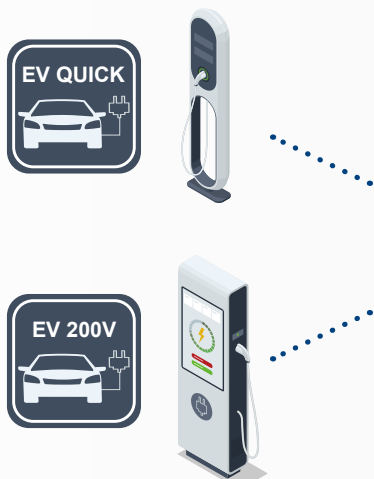
# Electric Charging Stations

## Application

As charging stations become more popular, fixed line connections become difficult and expensive to install and maintain. The AIW-346 provides a wireless solution without the need for additional cables, and the flexibility to add charging points for electric vehicles. The AIW-346 provides stability when connecting charging stations to local utilities and network providers. This helps users monitor charging status, station-to-station communication, data exchange, and other vital measures.

## Benefits

- Wide operating temperature support (-30~80 °C)
- Connection reliability supports remote update in unattended areas
- Device level carrier certifications



### MIO-5376

AMD Ryzen™ Embedded  
R2000 Series 3.5" SBC



### AIW-346

M.2 3052 Key B/  
Full-sized  
mini-PCIe



## Solution Highlight

- Qualcomm MDM9607
- Plug and play enables easy integration
- Carrier certification support





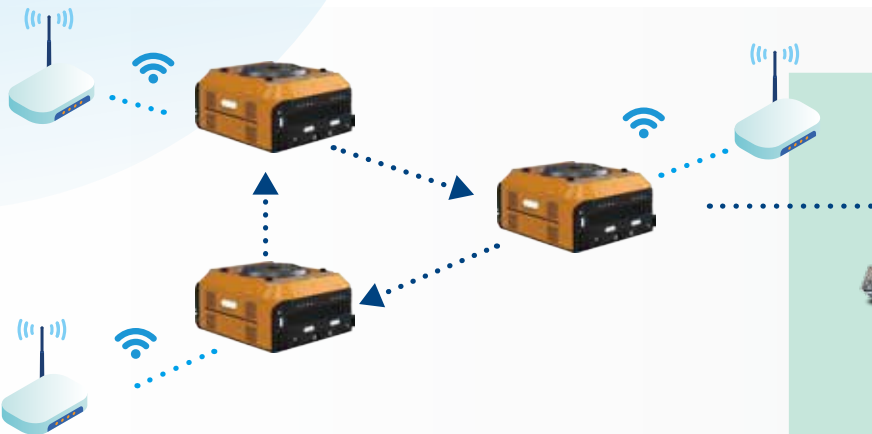
# Warehouse AGV

## Application

AGV vehicles need management systems that complete missions or tasks — including navigation and orders. This solution saves labor costs, reduces mistakes, and improves safety. These features are playing an important role in manufacturing warehouses and facilities.

## Benefits

- Supports roaming functions, switching connection to workable devices
- Supports design in service, passing certification and tests easier
- Good performance helps save time and resources



**MIO-5375**  
SBC w/ MIOe



**AIW-163**  
M.2 2230 A-E Key

**WiFi 6**  
CERTIFIED

## Solution Highlight

- Supports High Data Rates (1201Mbps)
- Certification for multiple countries
- Supports roaming functions





# Autonomous Delivery Robots

## Application

AMR are being used as autonomous delivery robots. The improvement of positioning precision is enabling these solutions to replace delivery persons. Indeed, Amazon and FedEx and some of their customers are adopting or developing this kind of robot.

## Benefits

- Accurate GNSS positioning helps AI route calculation without wasting time
- Economic combo kit, makes passing certification and testing easier
- Additional software services for precision enhancement





# Industrial Drones

## Application

Industrial drones are widely used in many different scenarios — like smart agriculture, defense, and smart city applications. In such applications, the Advantech AIW-210 helps address issues related to altitude by providing more precise location information. This is achieved by communicating with several satellites and updating the location much faster, delivering improved efficiency and yield optimization.

## Benefits

- With wide temperature support it is suitable for outdoor applications and critical tasks
- Supports tracking at 30000 m altitudes
- Additional RTK service is available for more precise tracking



**MIO-2375**

Single Board Computers

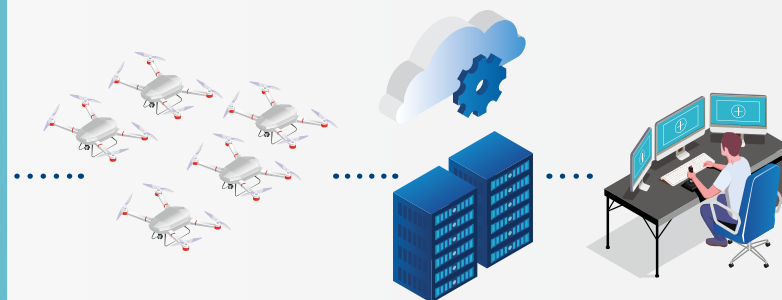


**AIW-210**

M.2 2242 B-Key

## Solution Highlight

- M.2 2242 form factor
- Could be tracked at 50000 m altitude
- Update rate up to 25Hz





# Interactive Airport Display

## Application

Wireless interactive displays reduce the manpower needed by airport service desks and provide more information during check-in and boarding. These solutions use Wi-Fi 6 to update information on time and provide weather forecasts, shop information, and up-to-date news.

## Benefits

- Multiple country certifications save costs
- Easy for Windows & Linux porting and evaluation processes
- Enhanced throughput from Wi-Fi 6 solution improves customer experience



### DS-085

Ultra-slim 4-Display Digital Signage Player



**Wi-Fi 6**  
CERTIFIED

**AIW-163**  
M.2 2230 A-E Key

## Solution Highlight

- Supports TWT (Target wake Time)
- Multi-Countries certifications
- Supports MU-MIMO & OFDMA



Weather information update



Shop information check



Flight information update





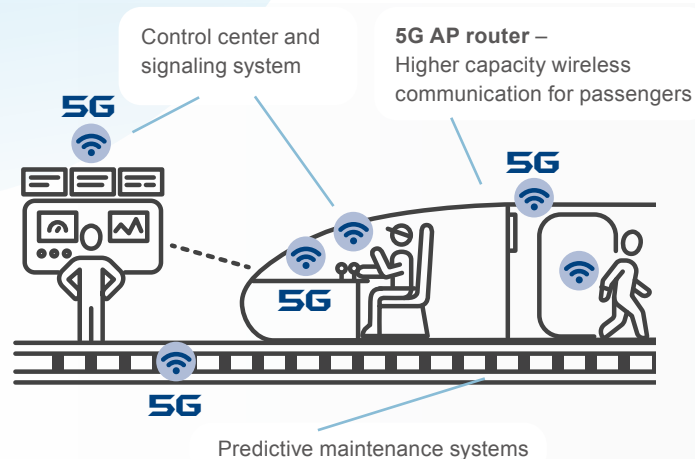
# Smart Railways

## Application

Demand for smart railway transportation is increasing in many countries. Consequently, train control, command, and signaling technology — including high-quality/-capacity passenger and train communications — is becoming more and more challenging. The Advantech AIW-355 5G wireless module can exchange data quickly on moving trains while supporting flexible, real-time communication with the OS.

## Benefits

- High-speed transmission rates enable reliable wireless connection to improve traveler experiences — even when using mass communication and myriad IoT devices.
- Ultra-low-latency enables real-time operation and traffic forecasts with AI while improving critical environment railway communications.



### ARK-1250

Fanless Box PC leveraging  
11<sup>th</sup> Gen Intel® Processor



### AIW-355

M.2 3052 Key B

5G

### Solution Highlight

- Qualcomm SDX55
- Support -30~75 °C operating temp
- NA/EU/CN 3 version





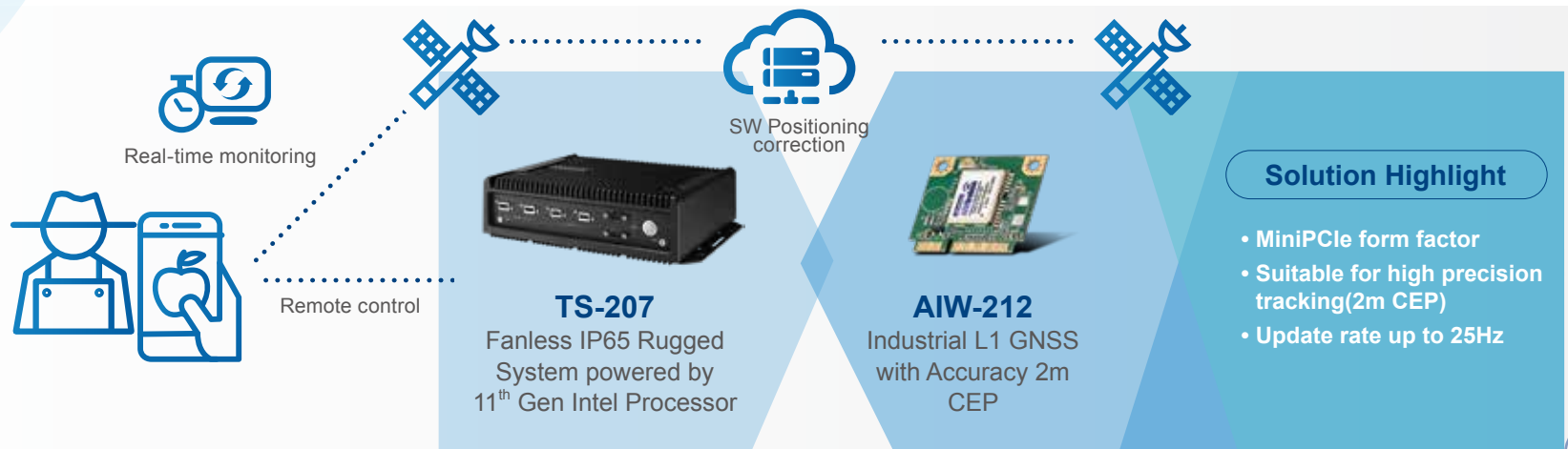
# Smart Driverless Tractors

## Application

AIW-212 leverages high-precision positioning to help farm owners reduce the labor needed for day-to-day tasks. Indeed, it also enables farmers to leverage AI when monitoring locations and statuses; and remotely control tractors via an app using 4G/5G connections.

## Benefits

- Easy function evaluation for advanced positioning
- Industrial grade solution for harsh environments
- Additional software services for positioning enhancement
- Long product life cycle





# Smart Locker Stations

## Application

Smart lockers are found in airports and bus, train, and package stations. The locker system in this case can report the status of such lockers to a central command center using a gateway. It can also be controlled using an app when a customers picks up or drops off their parcels. This application is driven by worldwide demand for contactless solutions.

## Benefits

- High-performance connectivity and data rate
- High compatibility with target platforms
- Technical support and consultation during evaluation



Admin



**EPC-U2117**  
Fanless embedded PC



**AIW-343**  
Full-sized  
mini-PCIe



**EWM-W159M201E**  
M.2 2230 A-E Key



## Solution Highlight

### AIW-343

- Qualcomm MDM9207
- Supports SIM Slot
- NA/EU/JP 3 version

### EWM-W159M201E

- Supports Fast Receiver Automatic Gain Control (AGC)
- Multi-Countries certifications
- Supports MU-MIMO & OFDM



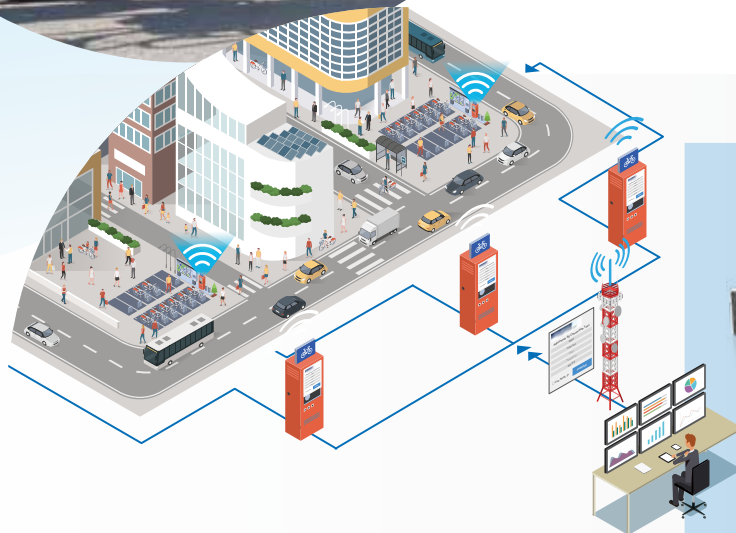
# Public Bike Service

## Application

Public transportation agencies seeking to leverage bike rental systems need to take the number of bikes, stations, and the control centers into consideration. Wireless technology reduces the cost of these systems and increases their usage. Advantech's AIW-344 LTE Wireless Modules deliver wide temperature support, stable connectivity and data transmission channels for public bike rental systems.

## Benefits

- Reliable connection performance
- Wide operating temperature support (-40~85 °C)
- Multiple RF certifications support



**ARK-2230**  
Modular Fanless  
Computer



**AIW-344**  
Full-size mini-PCle

## Solution Highlight

- Qualcomm MDM9607
- -40~85 °C wide temperature support
- NA/EU/JP 3 version

## Product Solution Guide

### AIW 100 Series - Wi-Fi 5/6/E & BLE Combo



Model Name	AIW-154	EWM-W159	EWM-W193	AIW-163	AIW-165	AIW-168
Part Number	AIW-154BN	EWM-W159M201E	EWM-W193H01E	AIW-163BR	AIW-165BN	AIW-168BM
Form Factor	M.2 2230 E key	M.2 2230 A-E key	HMC	M.2 2230 A-E key	M.2 2830 E key	M.2 2230 E key
Wireless Standards	Wi-Fi 5 + BT 5.2	Wi-Fi 5 + BT 5.0	Wi-Fi 5 + BT 5.0	Wi-Fi 6 + BT 5.2	Wi-Fi 6 + BT 5.3	Wi-Fi 6E + BT 5.3
Chipset	NXP 88W8997	RTL 8822CE-CG	RTL 8822C	RTL 8852BE	NXP 88W9098	MTK 7922
Signal Protocol	Wi-Fi: PCIe BT: UART	Wi-Fi: PCIe BT: USB	Wi-Fi: PCIe BT: USB	Wi-Fi: PCIe BT: USB	Wi-Fi: PCIe BT: UART	Wi-Fi: PCIe BT: USB
Antenna	2 x MHF4 connectors	2 x MHF4 connectors	2 x MHF4 connectors	2 x MHF4 connectors	2 x MHF4 connectors	2 x MHF4 connectors
Operating Voltage	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Temperature Range	-30~85 °C	0~70 °C	0~70 °C	0~70 °C	-40~85 °C	-10~70 °C
Dimensions	22 x 30 x 2.2 mm	22 x 30 x 2.2 mm	26.6 x 29.8 x 2.7 mm	22 x 30 x 2.2 mm	28 x 30 x 3.95 mm	22 x 30 x 2.2 mm
Security	WPA/WPA2/WPA3	WPA/WPA2	WPA/WPA2	WPA/WPA2/WPA3	WPA/WPA2/WPA3	WPA/WPA2/WPA3
MU-MIMO	2T2R MU-MIMO	2T2R MU-MIMO	2T2R MU-MIMO	2T2R MU-MIMO	2T2R MU-MIMO	2T2R MU-MIMO
Data Rate	IEEE 802.11ac: 867Mbps	IEEE 802.11ac: 867Mbps	IEEE 802.11ac: 867Mbps	IEEE 802.11ax: 1.2Gbps	802.11ax: 1.2Gbps	802.11ax: 1.2Gbps
OS support	Linux	Windows / Linux	Windows / Linux	Windows / Linux	Linux	Windows
Certifications	CE/FCC/IC/Telec/ NCC/AU	CE/FCC/IC/Telec/ KCC/...	CE/FCC/IC/Telec/ KCC/...	CE/FCC/IC/Telec/ KCC/...	CE/FCC/IC/Telec	CE/FCC/IC/Telec/ KCC/...

### AIW 200 Series - GPS



Model Name	AIW-210
Part Number	AIW-210XU-001
Form Factor	M.2 2242 B-key
GPS Type	Hardware Standalone
Signal Protocol	USB
Chipset	NEO-M9N
Operating Temperature	-40-85 °C
RF Receiver Type	GPS module, multi-GNSS (GPS/BeiDou/Galileo/ GLONASS/QZSS/SBAS)
GPS Acquisition	Cold Start: 24s / Hot Start: 2s
GPS Accuracy	Aided Start: 2s
GPS Sensitivity	Tracking & Navigation: -167 dBm Reacquisition: -160 dBm Cold Start: -148 dBm



## S & GNSS

## AIW 300 Series - 4G LTE

## 5G NR



AIW-211	AIW-212
AIW-211SU-001	AIW-212HU-001
LGA Type	Half-size Mini-PCle
Hardware Standalone	Hardware Standalone
USB	USB
NEO-M9N	NEO-M9N
-40~85 °C	-40~85 °C
GPS module, multi-GNSS (GPS/BeiDou/Galileo/ GLONASS/QZSS/SBAS)	GPS module, multi-GNSS (GPS/BeiDou/Galileo/ GLONASS/QZSS/SBAS)
Cold Start: 24s / Hot Start: 2s	Cold Start: 24s / Hot Start: 2s
Aided Start: 2s	Aided Start: 2s
Tracking & Navigation: -167 dBm Reacquisition: -160 dBm Cold Start: -148 dBm	Tracking & Navigation: -167 dBm Reacquisition: -160 dBm Cold Start: -148 dBm

Model Name	AIW-343	AIW-346		AIW-355
Part Number	AIW-343FQ-E01	AIW-346FQ-N01	AIW-346FQ-N02	AIW-355DQ-E01
Form Factor	Full-size Mini PCIe	Full-size Mini PCIe	M.2 3052 B-Key	M.2 3052 B-key
SIM Slot	Yes	Yes	Yes	no
Radio Technology	LTE Cat.4 + GPS	LTE Cat.4 + GPS	LTE Cat.4 + GPS	5G NR SUB6/LTE FDD/LTE TDD/ WCDMA
Downlink/ Uplink	150Mbps/50Mbps	150Mbps/50Mbps	150Mbps/50Mbps	Max DL peak rate 2.5 Gbps NR Sub6 EN- DC/ Max UL peak rate of 900Mbps
Frequency Band	4G: Band 1, 3, 7, 8, 20, 28A / 3G: Band 1, 3, 8 / 2G: Band 3, 8	4G LTE bands: 2/4/5/12/13/14/66/71 WCDMA bands: 2/4/5	4G LTE bands: 2/4/5/12/13/14/66/71 WCDMA bands: 2/4/5	NR: n1,n3,n5,n8,n20, n28, n38,n41, n77, n78, n79 LTE FDD: Band 1,3,5,7,8,19,20,28 / LTE TDD: Band 38,40,41,42,43 WCDMA: B1, 3, 5, 8,19 / GNSS: support GPS, GLONASS, Galileo, BDS, QZSS /
Main Chipset	Qualcomm MDM9207	Qualcomm MDM9607	Qualcomm MDM9607	Qualcomm SDX55
Operating Temperature	Extended: -40~85 °C	Normal: -30~80 °C	Normal: -30~80 °C	-30~75 °C
Signal Protocol	USB 2.0	USB 2.0	USB 2.0	USB 3.0/3.1
Support Area	EU	US	US	EU
Certifications	CE, GCF, NCC	FCC, PTCRB	FCC, PTCRB	CE, GCF



**WiFi 6**  
CERTIFIED

**WiFi 6E**  
CERTIFIED

Wi-Fi 6, Wi-Fi 6E  
Multiple O/S

**4G LTE** **5G**

4G LTE, 5G NR  
Multiple Form Factor

**GPS** **GNSS Compare**  
Research lab in your pocket

GPS/ GNSS  
High Precision

**Design-in Services**

RF Antenna &  
Wireless Software

## Regional Service and Customization Centers

**China** Kunshan  
86-512-5777-5666

**Taiwan** Taipei  
886-2-2792-7818

**Netherlands** Eindhoven  
31-40-267-7000

**Poland** Warsaw  
00800-2426-8080

**USA** Milpitas, CA  
1-408-519-3898

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### Asia Pacific

#### Taiwan

Toll Free 0800-777-111  
Taipei & IoT Campus 886-2-2792-7818  
Taichung 886-4-2372-5058  
Kaohsiung 886-7-392-3600

#### China

Toll Free 800-810-0345  
Beijing 86-10-6298-4346  
Shanghai 86-21-3632-1616  
Shenzhen 86-755-8212-4222  
Chengdu 86-28-8545-0198  
Hong Kong 852-2720-5118

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Israel 072-2410527  
Turkey 90-212-222-0422  
Turkey-Bursa 90-224-413-3134

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Nagoya 81-0800-500-1055  
Nogata 81-949-22-2890

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Seoul 82-2-3660-9255

#### Singapore

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Penang 60-4-537-9188

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Hochiminh 84-28-3836-5856

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Melbourne 61-3-9797-0100

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Pune 91-94-2260-2349

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Breda 31-76-523-3100

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Düsseldorf 49-2103-97-855-0

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#### Sweden

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#### Poland

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St. Petersburg 8-812-332-57-27  
8-921-575-13-59

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Ústí nad Orlicí 420-465-524-421

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Galway 353-91-792444

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Irvine 1-949-420-2500  
Ottawa 1-815-433-5100  
Chicago 1-888-576-9668

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São Paulo 55-11-5592-5367

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