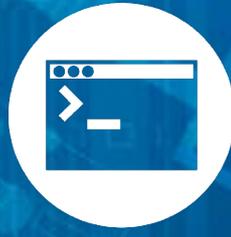


DEVICES



SDK



SERVICES

A smart, strong and simple platform to bring your data-driven solutions to life.

APPAREO
 **iot**



DEVICES

Gateways

Appareo's gateways are advanced and powerful computing platforms that allow you to customize your hardware interface while still being affordable. Each gateway model incorporates a full-featured software development kit (SDK) for simplified custom application development.

With an IP69K environmental rating, the lightweight and rugged enclosure protects the technology and allows placement in some of the most extreme environments around the world.

Appareo's input/output modules connect seamlessly with the gateways to enable an array of applications, such as high-powered DC or stepper motors, PWM, hydraulic valve control, sensor inputs and other auxiliary I/O.



Appareo's gateways offer a wide range of communications enabling global connectivity to a diverse set of devices. For example, the Wi-Fi and Bluetooth radios allow easy integration with iPhones and iPads. Below are the specifications for the Gateway 300 model.

Features

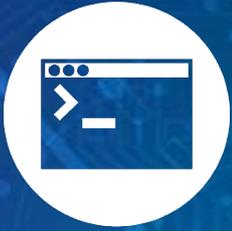
- ✓ 6x CAN bus (ISO 11783, J1939)
- ✓ Digital I/O
- ✓ Serial interfaces (USB, RS232)
- ✓ 802.11 B/G/N WiFi
- ✓ Bluetooth V2.0/4.0
- ✓ Cellular (GSM 2G/3G, CDMA 2G/3G, LTE)
- ✓ GPS
- ✓ Global ISM bands (433MHz, 868MHz, 916MHz, 2.4 GHz)
- ✓ Iridium satellite radio
- ✓ Dual-core ARM Cortex A9
- ✓ 4 GB eMMC standard storage
- ✓ 512 MB DDR3L RAM
- ✓ Embedded Linux
- ✓ SDK for custom applications
- ✓ IP69K environmental ratings
- ✓ Low power mode

Applications

- ✓ Machine control
- ✓ Telematics
- ✓ Virtual terminal support

Regulatory and Network Certification

- ✓ Iridium Network
- ✓ Verizon Network
- ✓ Vodafone
- ✓ CE
- ✓ RCM
- ✓ IC
- ✓ FCC



SDK

The Appareo Software Development Kit (SDK) provides the flexibility to build custom applications across multiple hardware platforms while interfacing with devices that are accessible via standard API.

The SDK allows you to develop applications on the gateway that create detailed control systems and telematics solutions. Appareo has a mature field-deployed software update framework.

Features

- Utilizes C++ and JavaScript environments and libraries
- Easily embedded Linux application packaging
- Safety-oriented JS-to-C++ remote procedure call framework
- Objective-C template application to simplify iOS application development
- Virtual Terminal (VT) support



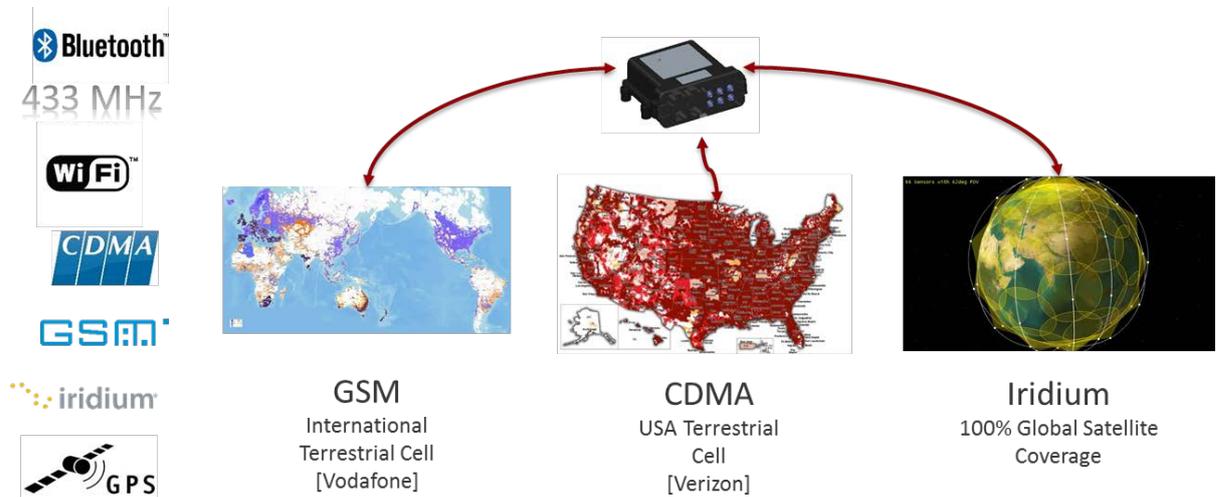


SERVICES

Appareo IoT is unique in that it offers everything you need to build a true end-to-end solution. Everything from global data management, device management and account management is supported by Appareo IoT services.

Worldwide Data Plans

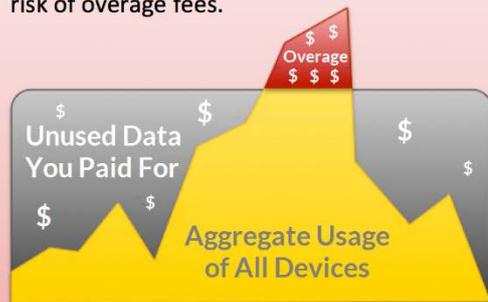
Appareo's global carrier relationships make the connection of your machines to your cloud seamless. We dramatically simplify provisioning and provide highly competitive data pricing.



We have intelligent algorithms that enable your equipment with seasonal or bursty data patterns to ramp up and down without having to manage your data plans. This gives you the flexibility you need while only paying the minimum for the data you need.

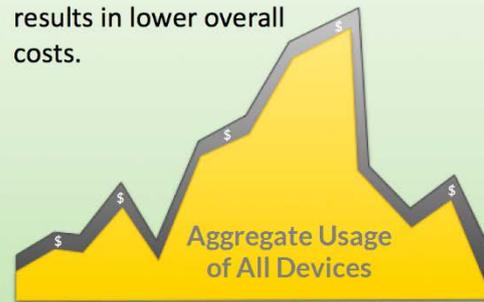
Typical Data Plans

Stock carrier plans result in higher costs by keeping devices in higher data plans to avoid overage most of the time, but there is still risk of overage fees.



APPAREO

Appareo's system keeps individual devices in the lowest plan possible and pools data with other devices. This results in lower overall costs.





SERVICES

Customer, Account and Device Management

Appareo IoT's account management enables easy secure account creation and management of customer accounts. Our data service platform can track the connectivity and health of connected devices. With remote diagnostics, problems can be detected, prevented, and repaired without sending a tech to the field. Advanced features such as remote firmware updates and data service provisioning dramatically simplify your application development.

The screenshot displays the 'Data Services Portal' for 'Appareo Systems LLC'. The main section is titled 'Devices' and shows a list of 23 devices. The interface includes a sidebar with navigation options: Devices, IMEI, IMSI, Usage, Operations, Notifications, and Asset Tracking. The device list table has columns for Device Type, Serial #, Health, and Firmware Status. The health status is indicated by a grey exclamation mark (warning) or a red exclamation mark (error), and the firmware status is indicated by a green checkmark (success) or a grey exclamation mark (warning).

Device Type	Serial #	Health	Firmware Status
Appareo Gateway 300	000219	!	!
Appareo Gateway 300	000216	!	!
Appareo Gateway 300	000217	!	!
Appareo Gateway 300	000012	!	!
Appareo Gateway 300	000013	!	!
Appareo Gateway 300	000214	!	!
Gateway device VM	GatewayVM-Tmp-0001	!	!
Gateway device VM	GatewayVM-Tmp-0002	!	✓
Gateway device VM	GatewayVM-Tmp-0003	!	✓
Gateway device VM	GatewayVM-Tmp-0004	!	✓
Appareo Gateway 100	Gateway100-test	!	!
Appareo Gateway 100	ICON00006Y	!	!
Appareo Gateway 300	000317	!	!
Appareo Gateway 300	000314	!	!



CHC Helicopter

CHC Helicopter provides offshore transport, search and rescue, and emergency medical services in 30 countries, so they were looking to develop software systems to implement their standards at a global scale. Appareo worked with CHC to provide its pilots with an airborne electronic flight bag (EFB), and to provide ground-based personnel with desktop flight planning tools. Additionally, these tools were integrated with their enterprise flight management, crew management and aircraft management and ERP systems. The custom enterprise system is now driving operational efficiencies, creating a safer flight environment for crews and customers.



Harris operates the largest air traffic control surveillance network in the world for the FAA; a network that does not detect aircraft flying lower than several hundred feet. As the number of airborne unmanned aircraft system (UAS) is only growing, Harris engaged Appareo to build a low-cost ground-based sensor to track low-flying UAS. The data that is collected can either be used locally by the UAS pilot or sent over Ethernet, CDMA or a GSM network where it is processed and provided to remote pilots who are operating UAS beyond visual line of sight. It can also be used by pilots of manned aircraft when they are operating in environments where UAS may be present.

SEED HAWK

Seed Hawk, a market-leading manufacturer of large, no-till, air-seeder systems in Western Canada, wanted a custom control system. Appareo designed an entire electronics system, including the control logic and the user experience to accompany the system. Named iCon™, the system incorporates a distributed network of power modules that are commanded by the gateway to execute certain tasks, such as: turning electrical motors for the seed metering system, actuating hydraulic valves, controlling fan speeds, powering lights, and more. The control system monitors and controls every aspect of the machine to create a nearly-autonomous air seeder system. A cloud-based transfer of prescription map files to and from the machine was also implemented to create a fully stand-alone system.



Väderstad is a progressive manufacturer of high-quality planting, seeding and tillage equipment most prevalent in Europe. The company engaged Appareo for an entirely new machine control architecture. Appareo's gateway contains all the control logic necessary to operate a planter, and commands other ECUs on the CANBUS to execute machine tasks or get information. The operator has the ability to utilize an ISOBUS compatible Virtual Terminal, an iPad display, or both at the same time. With the inclusion of an iPad as a control interface, all functions can be performed wirelessly to the machine, which has made out-of-cab operations much more convenient.



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