NEXCOM
The Intelligent Systems

IoT Development Tool Selection Guide

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IoT Development Enters the Open Innovation Craze

The Internet of Things (IoT) is a major trend, and one of the most popular industry models for IoT implementation today is to combine cloud computing and big data analytics technology to develop application-specific solutions. But the big question is how to accelerate the development of such vertical IoT applications?

Businesses across different fields hope IoT can accelerate the expansion of different vertical applications. Many businesses, although eager about IoT development, still operate on a traditional, closed architectural approach, and are bounded by the limits of their products, technology, and industry knowledge. As such, most businesses struggle to respond effectively to the rapid market change, stagnating the overall market transition.

NEXCOM believes by adopting the principles of the sharing economy; making relevant software tools freely available to download through an open platform backed by a complete supply chain management and online marketplace, developers and makers alike can tap into a pool of collective wisdom and expertise to further accelerate IoT growth.

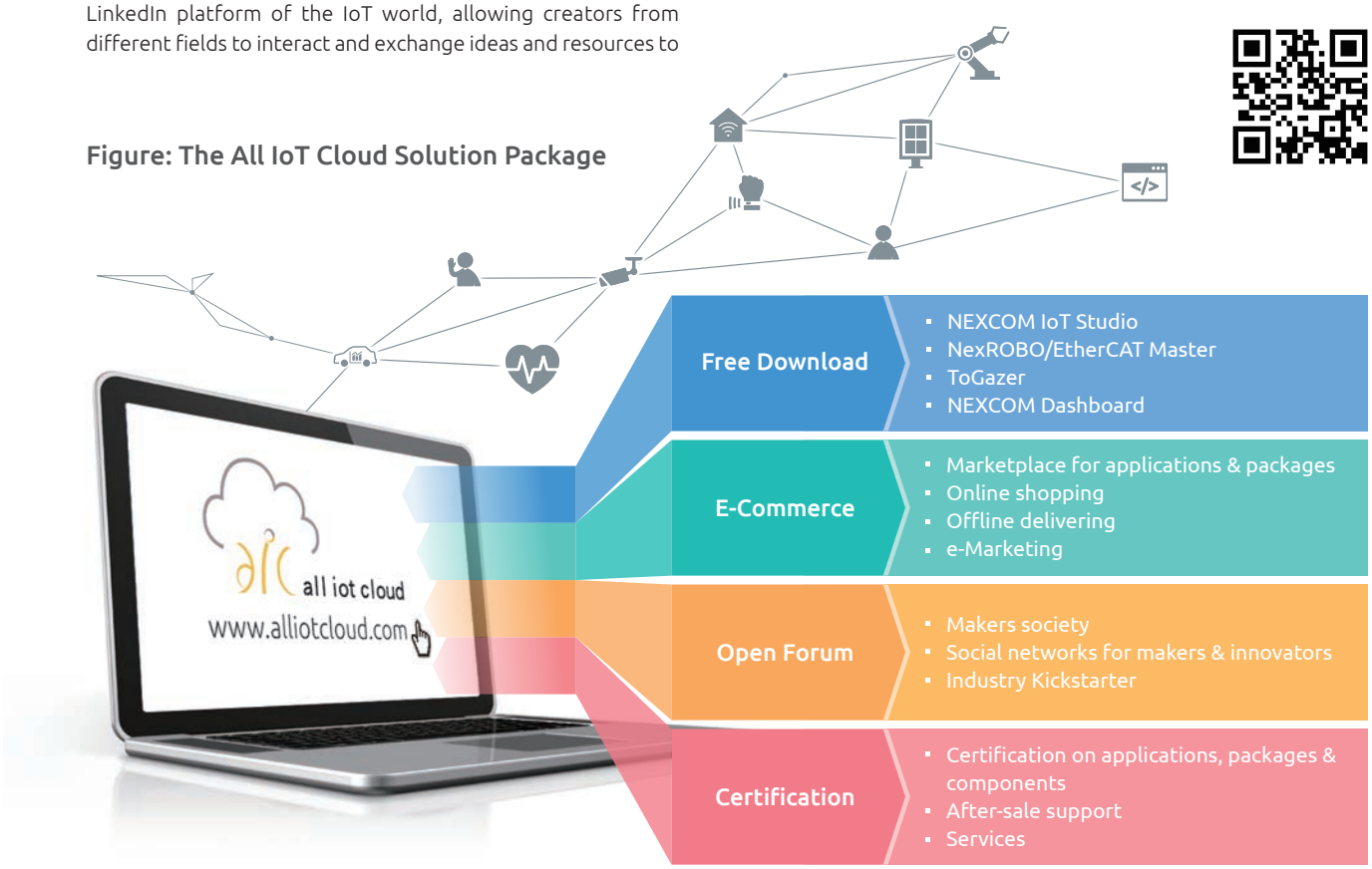
A service-based open platform can offer a solution to IoT development challenges in two ways. First, it can function as a marketplace that provides a complete supply chain of cross-industry applications, products, components and solutions, assisting creators to quickly obtain the required resources to focus on application development. Second, it can serve as the LinkedIn platform of the IoT world, allowing creators from different fields to interact and exchange ideas and resources to solve design uncertainties and trigger new inspirations.

NEXCOM has developed software available on an open platform for users to download. NEXCOM IoT Studio software, which is an open source configuration tool based on a drag-and-drop design, offers a simple way to map frontend and backend connections of IoT devices, allowing developers to focus efforts on applications. NEXCOM looks forward to an open IoT community and offers NEXCOM IoT Studio free of charge. Additional NexROBO robot control simulation software, EtherCAT master software and ToGazer video conferencing software are also available on an open platform for users to download.

NexROBO can assist the application development of smart robots, freeing up the time required for developing motor drives and controllers for laboratory testing and the time to code motor control programs. It helps familiarize developers with robot operating conditions and allows them to focus on algorithm design. ToGazer, on the other hand, is a WebRTC-based video conferencing tool that allows users to conduct long-distance, multi-session conferences through web browsers. It includes network video recorder (NVR) functionality for archiving conference sessions. ToGazer can also be used in other applications such as video surveillance and image analytics.

To download free software or exchange knowledge and ideas, please visit www.alliotcloud.com

Figure: The All IoT Cloud Solution Package



NEXCOM IoT Studio

NEXCOM IoT Studio is the easiest IoT application builder: with a simple drag and drop and click of a button, connection links between nodes can be established in a flash. Based on NEXC2C technology, NEXCOM IoT Studio offers developers and makers alike a tool to facilitate data extraction from equipment, sensors and devices easily through an intuitive graphical user interface (GUI).

Introduction

IoT Plug-and-Play: Sensors, end devices, equipment, meters and more-all construct a complex network. Connecting these components together and extracting information from them can prove to be a big problem for building an IoT application. NEXCOM introduces NEXC2C technologies to relieve the burdens of network management and data acquisition. Simply connect the NEXC2C-capable gateway to the pre-defined and certified sensors and devices, drag the identified nodes detected in NEXCOM IoT Studio and drop them on the panel—watch the data pop up within a blink of an eye.

Intuitive GUI: Even an experienced engineer has to spend a lot of efforts to implement an IoT solution by tweaking drivers, revising source codes line by line, and verifying the data received from end devices with very primitive tools. NEXCOM IoT Studio provides a web-based GUI where data paths can be defined quickly through simple actions. All of a sudden, the data you need is just there.

Open Environment, Cloud Service Ready: NEXCOM IoT Studio is based on Node-RED. Experienced engineers can easily use JavaScript to write their own data handler functions. API and documentation are available to help users revise code accordingly. In addition, with cloud integration, NEXCOM IoT Studio not only can link to cloud services provided from IBM Bluemix and Microsoft Azure, but also display collected data in local dashboards.

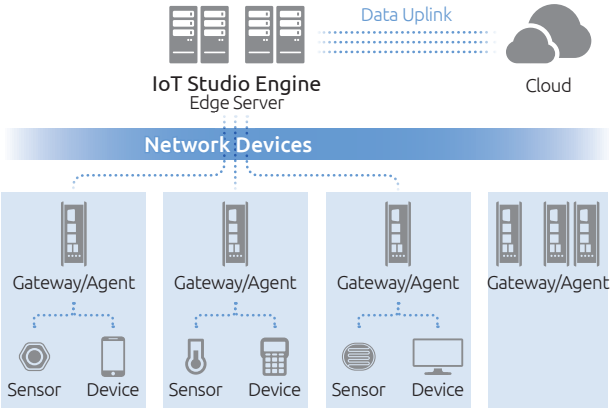


Figure: IoT Studio Control/Data Pipeline Architecture

Main Features

- Data acquisition through drag-and-drop controls
- Open source and open API flexibility for makers
- Support multiple industrial protocols
- Neat and simple Node-RED Web UI
- Sensors PnP
- Data visualization through dashboards
- Cross hardware platform support: x86 and ARM ready
- Link to major cloud service providers, including IBM, Microsoft, etc.
- Support various OS: Windows, Wind River MI, and Yocto Linux

Application Scenario

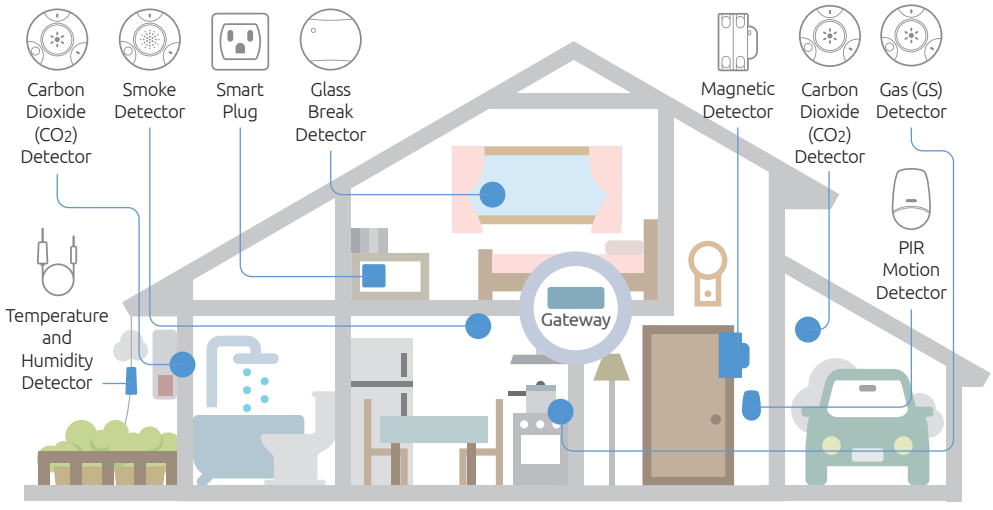


Figure: Smart Home Application

NexROBO Simulator

Experience robot operation immediately with NEXCOM's free NexROBO robot simulation software. By downloading the freeware, you can learn control operations of a 6-axis articulated robot without the need of a physical robot arm.

Introduction

NexROBO is an open EtherCAT-based robot solution that includes modular components of a full-fledged industrial robot system, ranging from controller platform, robotic control software, teach pendant, to robot body. NexROBO simulator software simulates operation of a 6-axis articulated robot for path plan checking. Designed to assist the application development of smart robots, NexROBO frees up the time required for developing motor drives and controllers for laboratory testing and the time to code motor control programs. It helps familiarize developers with robot operating conditions and allows them to focus on algorithm design.

Main Features

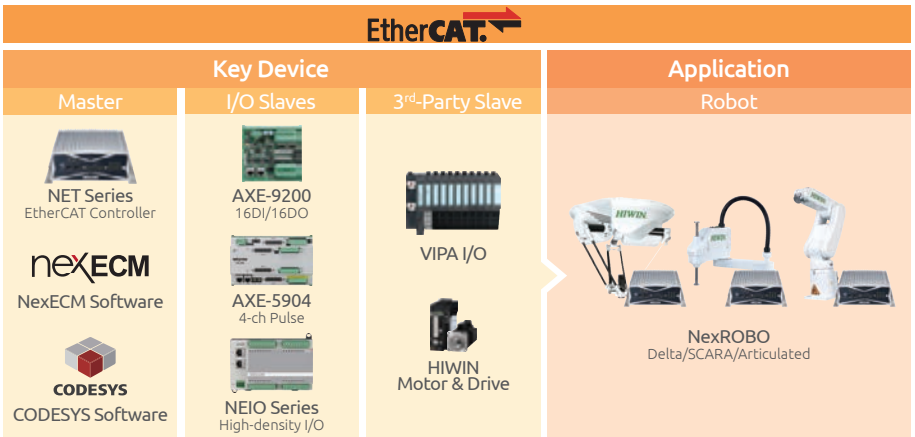


Figure: EtherCAT-based NexROBO Solution Package

Real-time Robotic Control Powered by EtherCAT: EtherCAT is a well-known fieldbus protocol that provides stable and real-time industrial communication. EtherCAT-based robot solutions leverage the high accuracy and high throughput nature of the EtherCAT protocol to ensure real-time robotic control. All robot operations are executed within 1ms cycle time.

Multiple Programming Language Support: NEXCOM's EtherCAT solution supports both C/C++ and IEC 61131-3 programming to offer user friendliness and flexibility for different development environments. Users can take advantage of the multi-language support by selecting suitable software to develop their robot applications.

Simulate Movements in Advance: NexROBO software provides user trajectory simulation of a 6-axis articulated robot along with movement imitations. Robot operations can be tested and verified in advance by just connecting to 6 EtherCAT drives and motors, even without a physical robot arm. Any robot control applications that require pre-testing can be simulated for validation before real operation of robots.

Strong Compatibility with Diverse Robot Types and Drives: NexROBO supports 6-axis articulated robots, 4-axis SCARA robots and 3/4-axis delta robots, which are the three most commonly used industrial robot types. Users can easily find compatible drives to build robots for industrial applications.

- Supported Robot Types
  - 6-axis Articulated
  - 4-axis SCARA
  - 3-axis/4-axis Delta
- Supported EtherCAT Drives
  - Yaskawa Sigma 5
  - Hiwin D2, D1
  - OMRON R88D
  - Delta A2E
  - Servotronix CDHD
  - Sanyo PB4D
  - Panasonic MINAS A5B
  - Mitsubishi MR J3-T04

Bundled Package Catered for Developers: NexROBO provides an open robot platform for users to focus on robotic control development. All the hardware installation and circuit integration of a robot, including motors, drives, speed reducers and so forth are provided by NEXCOM, saving tremendous time and effort in development. Mechanical safety is also implemented by adding joint limits to prevent possible damage caused by robot body's mechanical constraints.

Application Scenario

Mobile Phone Testing Line: The testing process for electronic products is highly automated to meet the ever-increasing manufacturing demands. Among various products, mobile phones require the most complicated testing process in which some of them can only be achieved through machines or robots. Robots with simulation capability help users to easily develop control system for testing line.

System Requirement:

- Control 6-axis articulated robot
- Remote I/O for texture control

ToGazer

ToGazer is a WebRTC-based video conferencing system featuring multi-point video conference, desktop-sharing, file-sharing and whispering. With rich features, NEXCOM ToGazer provides much more than just conferencing, it can be used for interactive distance learning, family reunion, customer service and community, and many more.

Get together anytime, anywhere: NEXCOM ToGazer offers web-based interactive video and audio system supporting multiple platforms, such as different browsers, mobile phones and tablets.

One place for all communication and collaboration needs: The "Free-download" edition allows 4 people to join one meeting room for project collaboration discussions, focus group meetings, board meetings and all kinds of gatherings.

Various product segments to meet different purposes: NEXCOM ToGazer plans for more product segments to create different value propositions in the coming future:

- Free-download edition contains abundant features for 1 meeting room with 10 participants including 4 speakers
- Preload edition provides the best functions to support 4 meeting rooms with 50 participants including 16 speakers in each meeting room
- Professional edition accommodates mass gathering of 8 meeting rooms with up to 200 participants including 16 speakers in each meeting room

Main Features

- Group Message: Sends the message to all of the attendees in the meeting group
- Whiteboard: Shares a whiteboard across the attendees
- Event Schedule: Reserves a conference time and notifies attendees in advance
- Single Sign-on: Terminates access to multiple software systems upon a single action of signing out
- Desktop Sharing: Shares the contents of the Desktop to the attendees
- Calendar: Integrates meeting schedules to the Outlook Calendar

Requirement & Diagram

- Minimum hardware requirements
  - Intel® Celeron® Processor N3150
  - 4GB DIMM
  - 50GB of free HDD space
  - 1 x 100Mbps Ethernet connection with static IP
- OS requirement: Ubuntu 14.04 LTS* 64-bit server/desktop

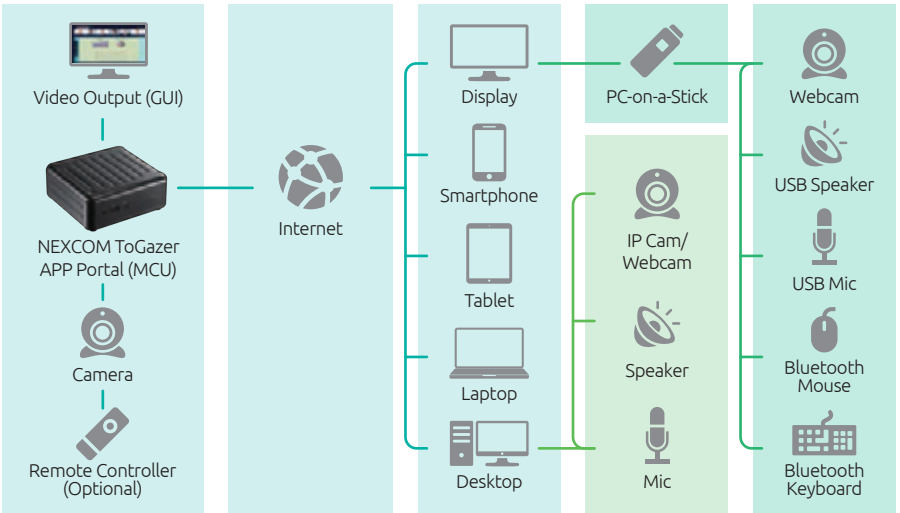


Figure: ToGazer Server Application Architecture

Application Scenario

Conference Meeting: Face-to-face video conferencing offers more effective communication through attendees' gesture and body language. When used in conjunction with our rich communication tools: whiteboard, screen sharing, file sharing, video conference sessions can be made more productive.

Long Distance Learning: There are more and more demands for distance learning through video conferencing systems as it provides a solution to the long distance problems for teachers and students who live in remote regions. For example, an English tutoring center can find teachers all over the world without the restriction of location and time zone. In addition, it can leverage the lower salary of English-speaking teachers from different countries to save business cost.

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