

DEVELCO

Technology Development Partner



Experts in

Electronics • Embedded Software

Wireless Communication Technology • IoT Solutions

Develco - Your External Danish Development Partner

Develco is an experienced and independent development house offering a full-service concept with focus on **Product Development** and **Production Management**. Develco is your Danish development partner for product development within electronics, embedded software, wireless communication technology and IoT solutions. As an external and independent development partner Develco is responsible for all aspects in the product development and the production management.

Develco has built a strong network to an ecosystem of strategic co-operation partners covering very different technological competences in relation to product development and production management.

The customers always own the finished product solutions and have all IP rights.

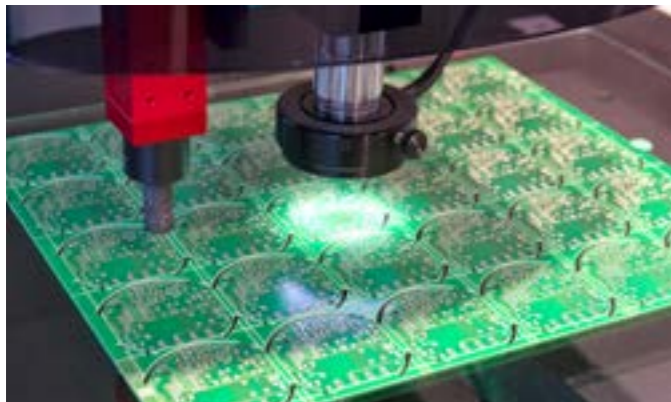
Product Development



With Develco as development partner you will be safely guided to the best product solutions. Development of electronics, embedded software, wireless communication technology and IoT solutions are among our core competences governed by excellent project management. We develop innovative products and solutions for public institutions, municipalities and industrial customers with their own product range. Our product development expertise comprises:

- Hardware
- Software
- Mechanics
- Design for Manufacturing
- Documentation, Test and Approvals

Production Management



Our full-service concept includes transformation of your product idea into a successful ready-to-launch product solution with production management throughout the entire value chain and product life cycle. Develco offers New Product Introduction (NPI) and our Production Management expertise comprises:

- Co-operation with EMS (Electronic Manufacturing Services)
- Production Documentation to EMS
- Control and Contingency Plan
- Test Planning and Coverage
- Quality Assurance
- Box Build
- Shipping

Quality Assurance



When co-operating with Develco you can expect the highest quality in our development of your new product idea. We constantly strive for improving our development methods in order to ensure the highest quality. We develop your innovative product with functionality and durability according to agreed business conditions with your company. Design for manufacturing is paramount for Develco to ensure the best quality in the production process and low production costs.



Develco has an ISO 9001:2015 certified quality management system, which is a common tool for all employees for supporting continuous improvement in quality, efficient management and focus on creating value for our customers.

Corporate Social Responsibility CSR

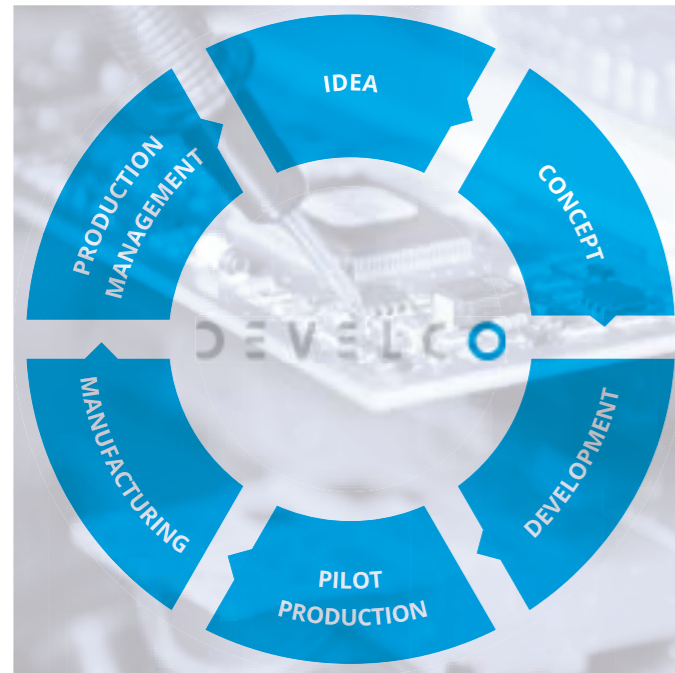


Develco acknowledges and accepts its social responsibility as a company. We have a CSR policy, in which we commit to act in a socially responsible way, taking into consideration human rights, social and working conditions, the environment and climate change issues. In addition, Develco focuses on sustainability and only co-operates with sub-suppliers having a CSR policy about their social responsibility. Develco develops innovative and sustainable technological solutions for the future for industrial companies and the society.



Develco follows the principles issued by UN Global Compact, which is a global initiative launched in 1999. The objective of UN Global Compact is to involve private enterprises and make them contribute to solving some of the substantial social and environmental changes arising in the wake of the globalization. Today UN Global Compact is one of the largest voluntary global networks for companies involved in Corporate Social Responsibility CSR. At Develco CSR is an integrated part of the day to day management.

From Product Idea to Production

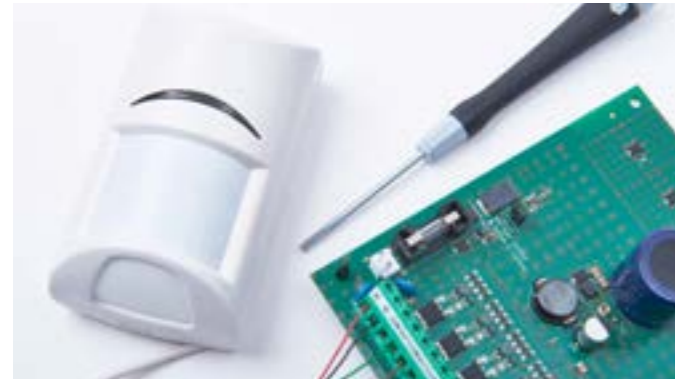


With Develco as development partner for your new product idea you co-operate with a development house handling the entire development process. Develco develops product solutions according to a well proven stage gate model through the following phases:

- Idea
- Concept
- Development
- Pilot Production
- Manufacturing
- Production Management

Develco works with high quality standards in any development project. By choosing Develco's full service concept Develco will take on the responsibility to guide you safely through all stages from your first product idea to the time when your product is to be withdrawn from the market and replaced by a new developed product meeting the future technological needs in the market. Our highly competent team provides a full-service offering, giving customers a winning edge.

Competences



Develco has competences in a wide variety of technologies including sensors, protocols, wireless communication, motor control, gateways and Internet of Things (IoT). With the increasing need for data, companies are developing new business models. Therefore industrial customers, municipalities, and public institutions demand intelligent solutions for the company and the society. Develco can guide you in the IoT world with billions of connected devices transmitting data over long distances into Cloud solutions for further big data analysis - and probably new business opportunities with even smarter and faster technologies.

Wireless Communication Technology



Develco has a long experience within wireless communication technology and works with a wide range of protocols for communication solutions. During a development project Develco chooses the best wireless solution fulfilling the customer's demands and needs listed in the specifications and qualifications of the future product.

Grundfos Alpha 15-55 HWR-D - Energy Efficient Circulation Pump



PRODUCT FACTS

- Bluetooth Low Energy BLE 4.2
- Meets California Energy Commission Title 24
- Temperature sensor with a battery life-time of +10 years and a fast response time with BLE
- Temperature sensor precision of +/- 0.1°F with a very short time constant achieved by a unique mechanical design
- Radio and safety approvals for use in the USA

CUSTOMER STATEMENT

"Develco has played a major role from the very beginning in the development of the HWR-D system for the USA right from elaboration of requirements specification to development of interface on the pump, temperature sensor, push button and repeater and handing over to production at Grundfos. I would like to give a great cadeau to Develco's project management and the good spirit in the co-operation. Develco's development team has been very proactive, serious and constructive in solving small issues during the development. Develco has taken responsibility throughout the development process and contributed significantly so that Alpha 15-55 HWR-D functions and has been introduced in the American market," explains Jakob Fly Hansen, Project Manager in Product Development at Grundfos.

Develco has in close co-operation with Grundfos developed the Alpha 15-55 HWR-D system for American households. The energy-efficient Alpha circulation pump communicates wirelessly via Bluetooth with a temperature sensor and up to 10 push buttons. Develco has developed mechanics, electronics and embedded software for both temperature sensor, push buttons and repeater. Due to changes in Californian legislation Grundfos needed to develop a water circulation pump system that only circulates hot water upon user request via push button. The legislation precisely dictates when the hot water is allowed to circulate based on live data of absolute temperature, temperature increase and time. These strict requirements demanded development of a temperature sensor with high precision, low thermal response time and fast communication. To minimize maintenance, an adaptive communication scheme has been used, because it reduces power consumption ensuring a battery life-time of more than 10 years on a single AA battery. Wireless communication always raises the question: Is the range sufficient? This issue has been addressed in the HWR-D system by simultaneously developing a discreet repeater that can be placed in problematic locations without installation or configuration.

"With Alpha 15-55 HWR-D Grundfos has developed a sustainable pump that saves thousands of liters of water and reduces energy consumption in private households in the USA. The user interface on the pump is simple and intuitive, and the system is "self-healing", so it is easy to install and requires no maintenance," says Develco's Project Manager Erik Refsgaard. *"Develco has been responsible for the entire development process including radio and security approvals for use in the USA and worked closely together with Grundfos NPI department to put the system's components into production,"* continues Erik Refsgaard.

iDOL 63 Cloud Gateway - Smart Farming with Data to the Cloud



dol SENSORS



PRODUCT FACTS

- ARM® Cortex® -M7, 2Mbyte FLASH and 512 kbyte SRAM
- Data Storage; 16Mbyte SDRAM, 8Mbyte FLASH and 32GByte SD-card
- 10/100 MB Ethernet
- Power over Ethernet, PoE 802.3 AT type 2
- 8 fully protected configurable Analog/Digital Inputs, with > 0.5% accuracy
- NFC via NDEF data format
- Secure connection to Azure using TLS and device specific certificates
- MQTT message protocol

For DOL Sensors, Develco has designed and developed hardware and embedded software for the iDOL 63 Cloud Gateway / IoT Enabler implemented with software protocols for integration with the Cloud. Develco has been working together with the NPI and PTA departments at SKOV A/S (DOL Sensors) about the production maturation phase of the IoT Enabler.

Project Manager Erik Refsgaard at Develco says: *“DOL Sensors came with the overall specifications to their gateway for smart farming. Throughout the entire design and development process we have had a close co-operation and a constructive dialogue with DOL Sensors about the intelligent iDOL 63 Cloud Gateway which must communicate data to the Cloud. Develco has digitized the analog sensors and connected the gateway to Microsoft Azure. For the IoT Enabler we have used the leading IoT protocol MQTT message protocol. All inputs in the gateway are generic and configurable via the Cloud or via NFC communication from e.g. a Smartphone. The iDOL 63 Cloud Gateway has an SD card storing all data in case of temporary disconnection from the Cloud, from where the software can also be updated. For DOL Sensors, data security has been of high priority, and consequently all gateways have individual certificates encrypting the sensitive data from the farms via HTTPS”.*

CUSTOMER STATEMENT

“DOL Sensors is one of the leading manufacturers of climate sensors for chicken and pig farms with thousands of sensors installed in +80 countries with the purpose to produce the best chickens and pigs. We needed a fast and easy Cloud Gateway that can be used by a single farmer and on large farms. The gateway must display all climate data from the farm on one screen: light, temperature, humidity, CO², ammonia and more. Develco has developed hardware platform, architecture and IoT solution making data available outside the farm. The match between DOL Sensors, SKOV and Develco has been absolutely perfect for us. Develco is an experienced and proactive development partner. We have been confident that the development project was completed as agreed, while we could concentrate on our core business. The good co-operation has characterized the entire project with development and design at DOL Sensor and start-up of production at SKOV”, says Product Manager Bo Fredborg at DOL Sensors.

Wireless Meter Grid - Frederiksberg Smart City



PRODUCT FACTS

- Wireless M-Bus
- WLAN
- MQTT protocol handling
- PoE (Power over Ethernet)
- Linux platform

The Municipality of Frederiksberg has become a smart city collecting household consumption data sent to a cloud solution for analysis of big data and optimization of energy consumption.

Frederiksberg Forsyning delivers water, heating and electricity to the Municipality of Frederiksberg and has more than 1000 gateways suspended in the street lightning and connected wirelessly to heat and water meters in the individual households. The gateways are PoE connected to a network of Access points to cover collection points for consumption data. This provides Frederiksberg Forsyning access to real-time data allowing for better and more precise regulation of district heating and water supply and savings in operating expenses. The smart city solution in Frederiksberg Municipality has a positive impact on the environment and contributes to sustainability.

CUSTOMER STATEMENT

“Develco has been a highly qualified sparring partner in connection with the choice of wireless technology, which is a difficult context-dependent decision. So, we have had Develco to develop a solution that matches our needs”, says Project Manager, Digitization Peter Daugbjerg Sørensen at Frederiksberg Forsyning.

Develco has developed both advanced application-level software implemented in a multi wireless platform enabled gateway and an outdoor use enclosure for the electronics. The application-level software enables the gateway to relay meter data from domestic meters to a cloud service. The software supports configuration of the gateway by the cloud service through a proprietary communication protocol designed and specified by Develco using the MQTT transport layer. For maintenance and update Develco has developed an autonomous and secure software update mechanism for the gateway, thereby making it possible to extend and correct the functionality of the gateway after initial deployment. Finally, Develco has managed production setup and is responsible for production and logistics.

Anywhere Smart Adaptor™ - Smart Lighting and Home Monitoring



PRODUCT FACTS

- Functions as a light dimmer
- Embedded sensors for measuring light, temperature, humidity and sound
- Wireless communication via Bluetooth Low Energy
- WiFi-connection with its own IP address
- Installation via the smartphone Anyware Home App™
- Europe: Outer thread is E27 and inner thread is for E14 bulbs
- USA: Outer thread is E26 and inner thread is for E12 bulbs

For the smart home Develco has developed the Anywhere Smart Adaptor™ – a small, complex and multiple featured device. The adaptor functions as a light dimmer, monitors the indoor climate in your home and can be used as an intrusion alarm. With WiFi, Bluetooth and the Anyware Home App™ on the smartphone the consumer can control and monitor light, temperature, humidity and sound. All data from the sensors in the discreet and elegant adaptor are sent to the Cloud.

With a specially designed flex-rigid printed circuit board Develco packed 133 electronic components into a small lamp socket adaptor. The PCB is placed between the inner and outer threads in the socket. An E14 LED bulb is screwed into the adaptor to be mounted into an E27 lamp socket.

CUSTOMER STATEMENT

“The development of the adaptor has been a question about finding the balance between functionality and design. We have succeeded owing to Develco’s competences. Develco were willing to develop the project, even though it was inexperienced development. Develco’s wide experience within IoT products was crucial and the reason that we now have a product obtaining high recognition. Anyware has won an innovation award in the smart home category at the CES 2018 fair in Las Vegas and Red Dot Design Award in 2019”, says Co-Founder & Partner Jan H. Christiansen at Anyware Solutions.

Intelligent Copenhagen Blinds - Smart Living



PRODUCT FACTS

- Wireless communication at 868.4 MHz
- Z-wave plus™ certified
- Other Z-wave products regardless of brand can be included in the system
- The blinds are Frequently Listening Routing Slaves FLiRS
- Processor, SMPS, motor driver, battery charger and antenna in one ø40mm PCB
- One PCB and one software cover all sizes of blinds
- Powered with one rechargeable battery consisting of 4 Li-Ion cells
- Time between charges + 1 year with “normal use”
- Automatic calibration of motor control by installation
- Detection and safety stop at unexpected load
- Vertical position within a few mm - also for groups of blinds
- Slat tilt within 2° degrees

The Danish design and development house Art Andersen and Inwido wanted to develop intelligent Venetian blinds with a modern design and an IoT solution for the smart home. Art Andersen and Inwido chose Develco as technological development partner.

Develco has been responsible for the embedded software and the hardware in the blinds. Develco has developed and implemented the electronics for motor control, battery control and wireless Z-wave communication. All the electronics are installed discretely in a small control unit containing all the necessary mechanics. The control unit fits into the top cylinder of the blinds without impacting the design.

The Copenhagen blinds can be programmed and controlled via a smartphone App for a comfortable indoor environment and a precise regulation of the position of the blinds in order to fit the user’s needs.

CUSTOMER STATEMENT

“Our learning has been that it can be difficult with development projects comprising both digital and physical elements”, says Development Manager Henrik Søgaard Pedersen at Inwido.
“You must have a more ad-hoc access – take a little step and see what to do next. From the physical products we are used to a stage-gate-process where we elaborate a time schedule, develop and finalize the development project. However, in the software world you are working on a sprint planning with short sprints and frequent evaluations of the progress. This we have learnt. We must not be so focused on plans, but be more flexible”, says Henrik Søgaard Pedersen.

Develco as Your Development Partner



We Co-operate with Your Company

Develco is both a flexible development house and a professional co-operation partner. We have an ongoing and constructive communication and dialogue with our customers during the entire development process. Our highly qualified engineers and project managers are dedicated to develop and realize your new product idea.

We Realize Your Innovative Product Idea

Before the initial development meeting with your company Develco has studied your business and the needs for developing new technological product solutions. Our commitment to the development process results in innovative technological product solutions giving your company a competitive advantage in your market with fierce competition.

We Are Flexible in the Development Process of Your New Product

Develco manages your development project with a high degree of flexibility. In the development process we can always customize the solution with specific product features according to the customer's wishes for the final product solution.

Develco as Your Development Partner



We Manage Your Development Project according to Plans

Our project management is structured and manages the development process either according to the customer's development model or Develco's own stage gate model. Develco finalizes your development project according to agreed plans and conditions. We are very aware that time to market for a new product solution is an important factor in transparent markets with high competition.

We Take Responsibility for Your Entire Development Process

Develco is your flexible, creative and competent development partner and takes responsibility for the entire development process from the initial product idea to supplies of your final new product solution. We build strong relations to our customers based on responsibility and trust. With your choice of Develco as your development partner you can focus on your core business, while we focus on the development of your new innovative product idea.



DEVELCO 
Technology Development Partner

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