



SOLUTIONS FOR SMART CITIES



- ✓ Ultra low power Parcel Lockers
- ✓ Multi-screen locker solutions
- ✓ Quiet boxes / Silence Pods
- ✓ Queue Ticket Systems
- ✓ Off-grid Private Parcel Lockers
- ✓ Parking access controllers with AI
- ✓ Multi-battery smart charging stations
- ✓ Outdoor Off-Grid Power & HMI Solutions

About us



Halyna Kulska –CEO

Leonid Kulskiy – CTO

Our Team

Electronic Hardware Design Engineers (Altium Designer: Architecture, Schematics, Layout, Production files)

FPGA Engineers (Verilog, VHDL for Altera/ Intel, Xilinx, Microchip, etc.)

RF Electronics Hardware Experts (Microwave studio, HFSS, Matlab)

Layout Engineers (Altium Designer, Allegro OrCAD, Mentor, KiCAD)

Software/Firmware Engineers (MCU level, Linux Level, Android OS Level)

Industrial Designers (Rhino, Solidworks, Photoshop, CorelDraw)

Mechanical Engineers (SolidWorks, Inventor, Catia)

Web Developers (JS, Angular, React, Vue)

Our mission

“To make the World a safer, smarter and a better place with a help of Technology”

We are a professional team with more than 20 years of experience in electronics. We are doing more than expected to provide optimized solutions to our Customers. To do more means to have a deep understanding of the Customer task roots and to predict what will be needed in the future so we are doing the best to implement additional value with a reasonable budget. That is why our products and solutions could be precisely customized in short terms.



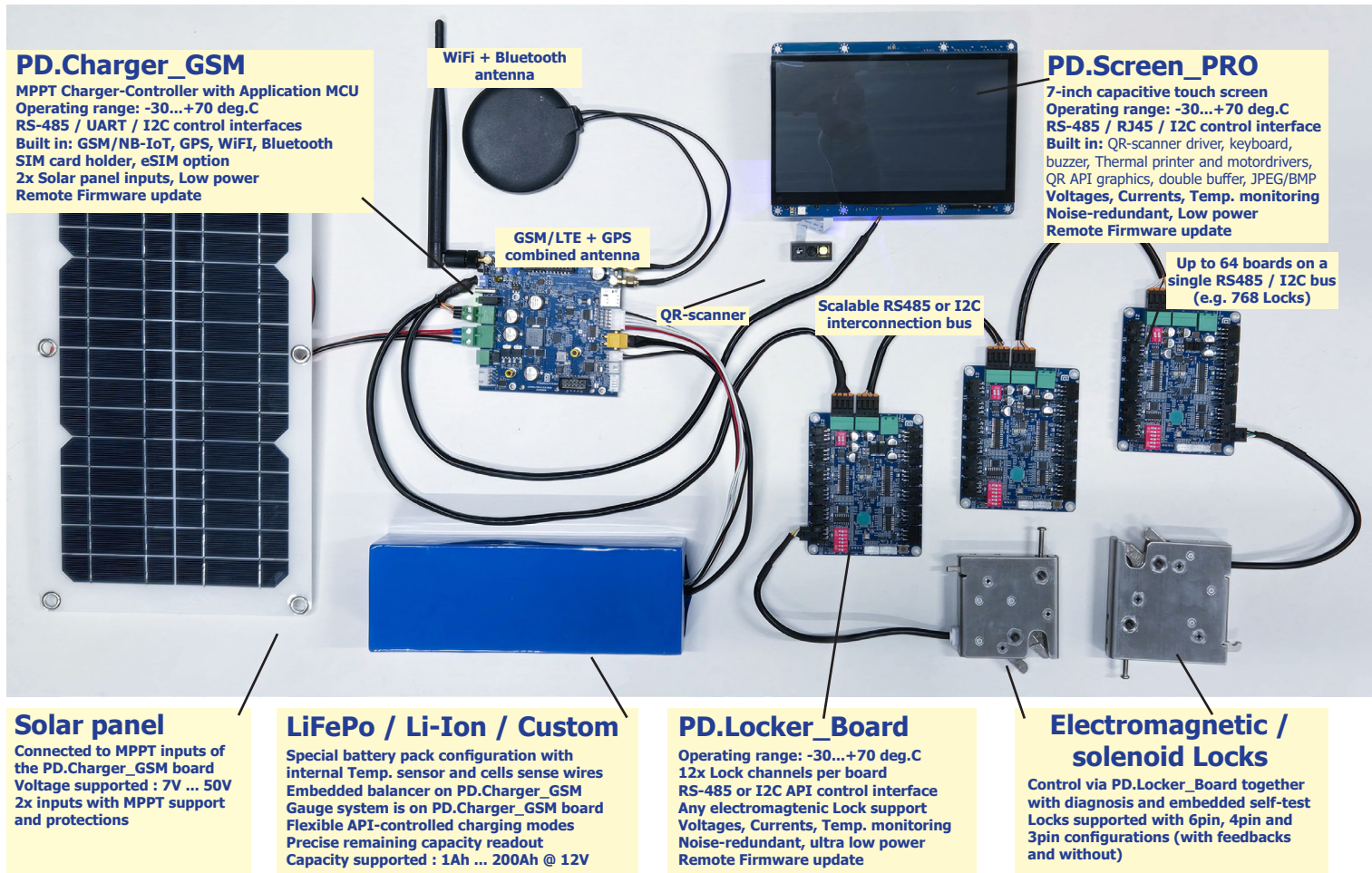
Our solutions

Smart Parcel Locker Solution	4
Multi-Screen Off-Grid Solution	6
Private Parcel Locker Solution	8
Parking Access Control Systems	10
Smart Silence Pods / Mute rooms	12
Queue Management Systems	14
Multi-battery charging stations	14
Energy Monitoring and Forecasting	15
Batteries charging and remote monitoring	15



Smart Parcel Locker Solution

Autonomous Off-Grid Parcel Locker Solution - Starter Kit



PD.Charger_GSM
 MPPT Charger-Controller with Application MCU
 Operating range: -30...+70 deg.C
 RS-485 / UART / I2C control interfaces
 Built in: GSM/NB-IoT, GPS, WiFi, Bluetooth
 SIM card holder, eSIM option
 2x Solar panel inputs, Low power
 Remote Firmware update

WiFi + Bluetooth antenna

GSM/LTE + GPS combined antenna

PD.Screen_PRO
 7-inch capacitive touch screen
 Operating range: -30...+70 deg.C
 RS-485 / RJ45 / I2C control interface
 Built in: QR-scanner driver, keyboard, buzzer, Thermal printer and motordrivers, QR API graphics, double buffer, JPEG/BMP
 Voltages, Currents, Temp. monitoring
 Noise-redundant, Low power
 Remote Firmware update

QR-scanner

Scalable RS485 or I2C interconnection bus

Up to 64 boards on a single RS485 / I2C bus (e.g. 768 Locks)

Solar panel
 Connected to MPPT inputs of the PD.Charger_GSM board
 Voltage supported : 7V ... 50V
 2x inputs with MPPT support and protections

LiFePo / Li-Ion / Custom
 Special battery pack configuration with internal Temp. sensor and cells sense wires
 Embedded balancer on PD.Charger_GSM
 Gauge system is on PD.Charger_GSM board
 Flexible API-controlled charging modes
 Precise remaining capacity readout
 Capacity supported : 1Ah ... 200Ah @ 12V

PD.Locker_Board
 Operating range: -30...+70 deg.C
 12x Lock channels per board
 RS-485 or I2C API control interface
 Any electromagnetic Lock support
 Voltages, Currents, Temp. monitoring
 Noise-redundant, ultra low power
 Remote Firmware update

Electromagnetic / solenoid Locks
 Control via PD.Locker_Board together with diagnosis and embedded self-test
 Locks supported with 6pin, 4pin and 3pin configurations (with feedbacks and without)

Modern smart locker and post box systems must operate without grid power, remain secure, and stay remotely connected—often for years with minimal maintenance. ProtoDevs Platform delivers a complete, ultra-low-power hardware ecosystem that enables manufacturers and integrators to build fully autonomous smart locker solutions faster and with lower risk.

Why Choose ProtoDevs for Off-Grid Smart Locker Systems?

Our solution is not just a display or controller. It is a purpose-built platform designed specifically for off-grid, unattended smart locker deployments.

Key Benefits:

- True off-grid operation with Solar panels and LiIon / LiFePO₄ battery support together with secondary input for on-grid sources (backup)
- Faster time-to-market using a developer-friendly ESP32 environment and a batch of examples

- Lower BOM and system complexity through an integrated ecosystem and modules full compatibility
- Industrial-grade reliability for outdoor and public installations (operational temp.range -30 ... +80 deg C)
- Scalable architecture from single locker compact system for private house to large distributed country-scale networks
- Customer-customizable Electronics is free-of charge for mass-production orders

Modern smart locker and post box systems must operate without grid power, remain secure, and stay remotely connected—often for years with minimal maintenance. ProtoDevs Platform delivers a complete, ultra-low-power hardware ecosystem that enables manufacturers and integrators to build fully autonomous smart locker solutions faster and with lower risk.

Smart Parcel Locker Solution



Why Choose ProtoDevs for Off-Grid Smart Locker Systems?

Our solution is not just a display or controller. It is a purpose-built platform designed specifically for off-grid, unattended smart locker deployments.

Key Benefits:

- True off-grid operation with Solar panels and LiIon / LiFePO₄ battery support together with secondary input for on-grid sources (backup)
- Faster time-to-market using a developer-friendly ESP32 environment and a batch of examples
- Lower BOM and system complexity through an integrated ecosystem and modules full compatibility
- Industrial-grade reliability for outdoor and public installations (operational temp.range -30 ... +80 deg C)
- Scalable architecture from single locker compact system for private house to large distributed country-scale networks
- Customer-customizable Electronics is free-of-charge for mass-production orders

The Central Brain & User Interface

The ProtoDevs PD.Screen family combines a modern capacitive touchscreen with a dual-MCU architecture optimized for security, performance, and ultra-low power consumption.

Dual-MCU Architecture – Power Without Complexity

- **ESP32 MCU** – Application logic, security, connectivity, and cloud communication
- **High-performance STM32 MCU** – Graphics rendering, touch processing, and display control with low-power by design

All graphics and touch handling are managed internally. Developers control the UI using **simple, high-level commands**—no advanced graphics expertise required.

Developer-Friendly by Design

- Extensive example libraries (QR-barcode scanner, Thermoprinter, keypad, GSM, GPS, WiFi, camera, secure MQTT streams, etc.)
- Supports Arduino IDE, PlatformIO, ESP-IDF, MicroPython and modern toolchains.

This approach reduces development time and engineering risk, enabling rapid prototyping and faster product launches.

Multi-Screen Off-Grid Solution

Off-Grid/On-Grid MultiScreen Solution - "MultiScreen Kit"

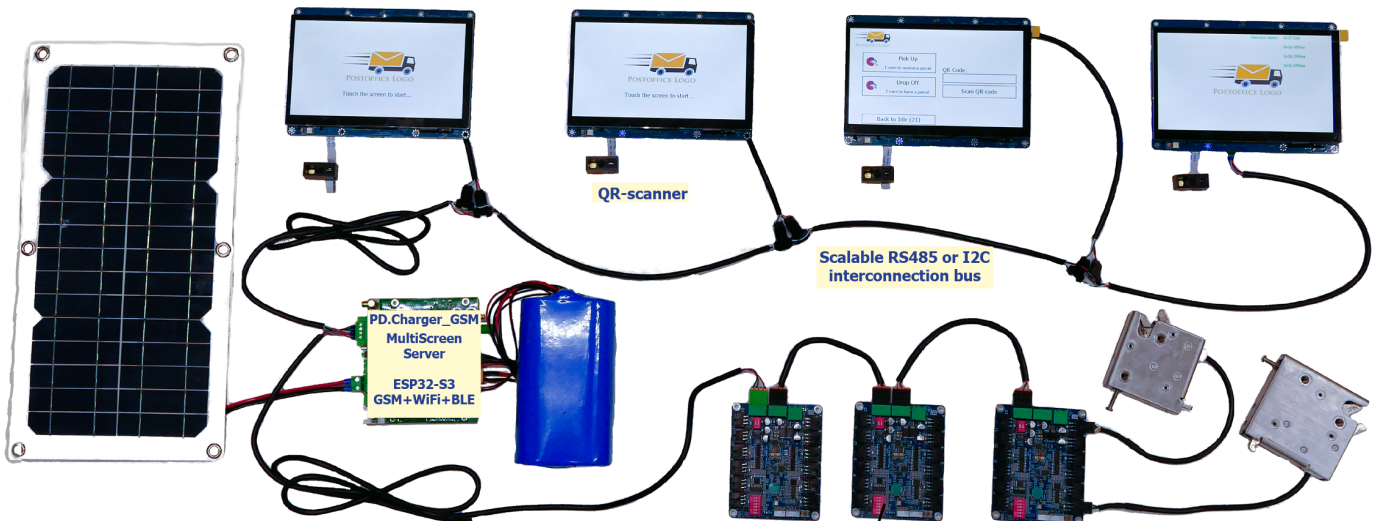
Applications : Parcel Locker Walls, Access Controllers, Queue controllers, Ticket systems

PD.Charger_GSM_MS

MPPT LiFePo/LiIon Charger-Controller with ESP32-S3 Application MCU
 Operating range: -30...+70 deg C
 RS-485 / UART / I2C control interfaces ; GSM/NB-IoT, GPS, WiFi,BT, BLE
 SIM card holder, eSIM option, 2x inputs (Solar, DIN in), Ultra Low power
 Remote Firmware update over I2C and RS485

PD.Screen_PRO

7-inch capacitive touch screen with MultiScreen support via RS485 and I2C
 Operating range: -30...+70 deg.C
 RS-485 / RJ45 / UART / I2C control interface
 Built in: QR-scanner driver, keyboard, buzzer, Thermal printer and motor drivers,
 QR API graphics input and output, double buffer, JPEG/BMP
 Remote Firmware update via I2C , UART, Ethernet and RS485



Solar panel

Connected to MPPT inputs of the PD.Charger_GSM board
 Voltage supported : 7V ... 50V
 2x inputs with MPPT support and protections

LiFePo / Li-Ion / Custom

Special battery pack configuration with internal Temp. sensor and cells sense wires
 Embedded balancer on PD.Charger_GSM
 Gauge system is on PD.Charger_GSM board
 Flexible API-controlled charging modes
 Precise remaining capacity readout
 Capacity supported : 1Ah ... 200Ah @ 12V

PD.Locker_Board

Operating range: -30...+70 deg.C
 12x Lock channels per board
 RS-485 or I2C API control interface
 Any electromagnet Lock support
 Voltages, Currents, Temp. monitoring
 Noise-redundant, ultra low power
 Remote Firmware update

Electromagnetic / solenoid Locks

Control via PD.Locker_Board together with diagnosis and embedded self-test
 Locks supported with 6pin, 4pin and 3pin configurations (with feedbacks and without)

Introducing ProtoDevs' Multi-Screen Off-Grid Solution!

ProtoDevs GmbH is proud to unveil a next-generation multi-screen smart locker solution engineered for ultra-low-power, off-grid and on-grid deployment with unmatched connectivity, modularity, and industrial-grade reliability.

Why This Matters for Your Business

In a world where last-mile delivery is becoming the battlefield for customer loyalty, infrastructure limitations shouldn't dictate where you can operate. Remote locations, urban dead zones, temporary installations—our solution goes where traditional systems can't.

Key Features:

- 4x PD.Screen_PRO Capacitive Touchscreens (Scalable Up to 64 Screens)
 Each screen features its own integrated QR code scanner, delivering:
 - Ultra-low-power STM32 as graphical processor
 - ESP32 as application processor
 - Optimized for simultaneous multi-user interaction with minimal energy consumption

- Engineered for ultra-low-power operation from Solar panels MPPT inputs + LiFePO₄ battery
 Serve more customers simultaneously without multiplying your power requirements.

- Flexible Networking Architecture
 RS-485 as primary protocol
 Full support for I²C, CAN, Ethernet, and UART
 Seamless integration with your existing systems—no proprietary bus lock-in

- Single PD.Charger_GSM Gateway
 All screens connect through one intelligent gateway featuring:
 - GSM/NB-IoT, GPS, WiFi, Bluetooth, LoRa, I²C, UART connectivity
 - Onboard charger + battery management (BMS)
 - Ultra-low-power design optimized for outdoor off-grid operation
 - Single 4-wire cable (power + data) dramatically simplifies installation
 One gateway. Total control. Minimal complexity.

Multi-Screen Off-Grid Solution



d) Smart Lock Management at Scale

- Up to 64 electromagnetic lock controllers
- Each controller supports 12 channels
- Maximum capacity: 768 locks with full diagnostics
- Real-time status monitoring and predictive maintenance alerts

e) Industrial-Grade Outdoor Operation

- Operating range: -30°C to +80°C
- Built to withstand rain, snow, dust, and extreme weather
- Vandal-resistant construction for high-traffic environments

f) Reliable API

Purpose-built for multi-screen protocol
Smooth, synchronized operation across all connected devices
Ready-to-use examples accelerate your development timeline

g) Software-Level Redundancy

If a screen is damaged—whether through vandalism or accident—other screens automatically assume its tasks. Your operation continues without interruption. Downtime becomes a non-issue.

h) Backward Compatibility

Connect to existing PC-based single-screen parcel lockers. Upgrade to multi-screen capability without replacing your current infrastructure.

ProtoDevs GmbH is revolutionizing last-mile delivery and multi-access infrastructure by combining:

Dual-processor ultra-low-power HMI Maximum efficiency, minimum operating costs

Industrial-grade durability Deploy with confidence in any environment

Multi-screen scalability Grow from 4 to 64 screens as demand increases

Flexible connectivity Integrate with any existing system

Turnkey compatibility Upgrade without replacement

Software-level redundancy Guarantee uptime, protect revenue

One scalable, off-grid solution. Up to 64 screens. Up to 768 locks. Zero compromises.

Private Parcel Locker Solution

Off-Grid/On-Grid Private Parcel Locker single-module Platform

Applications : Parcel Lockers for private houses, Remote storage rooms or garages control

Solenoid Locks drivers

2x channels of the electromechanical load drivers for locks or other power loads. Locks with feedbacks are supported (6-pin) as well as simple locks with 3,4,5 pins.

e.Paper screen

e.Ink / e.Paper driver on-board for 4-inch or custom

QR-scanner

Onboard QR-codes scanner driver for 1D and 2D scans

PD.Gateway

MPPT LiFePo/LiIon Charger-Controller with ESP32-S3 Application MCU
Operating range: -30...+80 deg C
RS-485/UART/I2C control interfaces ;
GSM/NB-IoT, GPS, WiFi, BT, BLE 5, LoRa (with MESH support)
SIM card holder, eSIM option, 2x inputs (Solar, DC in),
Ultra Low power by design
Remote Firmware update over GSM, I2C and RS485

NFC / RFID

Onboard RFID / NFC driver
External antenna connector

WiFi / BT / BLE antenna

LoRa antenna
MESH technology supported

GSM / NB-IoT / GPS
combined antenna

12V Output

Stabilized GPIO controllable
External voltage output
With Slow-Start feature

Solar panel

Connected to MPPT input of
the PD.Gateway board
Voltage supported : 7V ... 50V

External DC in

2nd channel - MPPT input of
the PD.Gateway board
Voltage supported : 7V ... 50V

RS485 and I2C

Scalable architecture sup-
ports external modules
Power is provided on both
connectors

External sensors

The PD.Gateway has several
embedded drivers for external
analog sensors :
weight, temperature, open

Keyboard driver

Embedded into e.Ink module
4x4 keypads supported
Membrane and Mecha types
Customization is possible

LiFePo / Li-Ion / Custom

Battery pack with internal Temp. sensor and cells sense wires
Embedded balancer on PD.Gateway board
Gauge system is on PD.Gateway board
Flexible API-controlled interface for charging modes
Precise remaining capacity readout and fine tuning for any battery
Capacity supported : 1Ah ... 200Ah @ 12V
Custom configuration is possible

Private Parcel locker Platform for low-power off-grid solar-based implementations

Missed deliveries cost time, money, and frustration. The average household in Europe misses more than one in four parcel deliveries — leaving packages at neighbours' doors, in improvised hiding spots, or returned to depot.

The Private Parcel Locker, built on the **PD.Gateway** hardware and firmware platform, solves this definitively: a weather-rated, solar-powered, keyless locker that accepts deliveries from any courier, notifies you instantly, and lets you collect on your own schedule.

PD.Gateway — an industrial-grade hardware module with production-ready parcel locker firmware. Everything your engineering team needs — power management, battery control, access control, connectivity, and device I/O — pre-integrated and pre-validated. You build the enclosure and the application layer. **PD.Gateway** handles the rest.

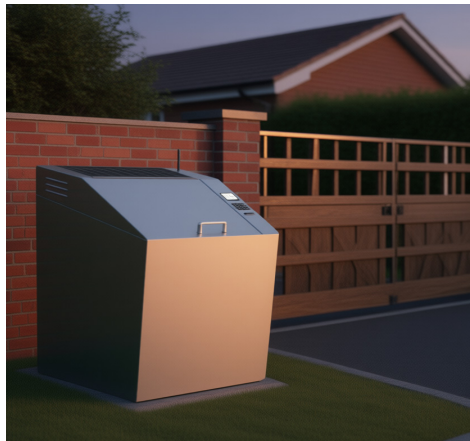
Processing

The application MCU is an **ESP32-S3**, providing dual-core 32-bit processing, hardware AI acceleration,

Private Parcel locker Platform for low-power off-grid solar-powered implementations

Private Parcel Locker Solution

Private parcel locker example renders:



and a mature ecosystem of development frameworks including **ESP-IDF**, **Arduino**, **PlatformIO** and **MicroPython**. A dedicated **STM32** co-processor manages all power functions — MPPT, battery state, charging control, and load management — independently of the application layer, so power management never competes with connectivity or lock control for CPU time.

Power system

PD.Gateway includes a complete power subsystem with no external components required. Two MPPT Solar/DC inputs support dual-panel configurations for higher charge rates or redundancy. The integrated BMS and battery gauge support both LiFePO4 and Li-Ion chemistries, with the firmware selecting charge profiles automatically based on battery type.

A controllable 12V output with Slow-Start feature provides power to the external peripheral modules. Built-in drivers for QR scanners, displays, or access panels and keypads are designed with full protections so voltage transients could not cause resets.

In practice, a 20W solar panel and a modest LiFePO4 pack provide year-round autonomous operation in Central European latitudes, even accounting for winter insolation levels and daily lock actuation loads.

Features

Parcel **locker firmware** — ready to flash
Lock actuation logic, access credential validation,

event logging, OTA update client, and cloud reporting hooks — all pre-built for ESP32. Customise via a documented configuration API and frameworks (ESP-IDF, Arduino, MicroPython, Platformio, etc.)

Certified RF stack

Wi-Fi, BLE, GSM/NB-IoT, LoRa, NFC/RFID, and GPS embedded. Your product inherits the CE certification — no chamber testing, no regulatory delays for GSM/GPS and LoRa interfaces.

Power subsystem — no external BMS needed.

MPPT solar charging, LiFePO4/Li-Ion battery management, ultra-low standby current, and a 12V slow-start output for your peripherals — all managed by a dedicated STM32 co-processor.

Dual solenoid lock drivers

Two independent drivers for solenoid locks or inductive loads — sized for industrial-grade actuators. Controlled directly from ESP32 firmware with configurable open/lock timing and feedback sensing.

NFC / RFID — antenna only

Full ISO 14443A/B, ISO 15693, FeliCa, MIFARE, and NFC Forum T1–T5 support onboard. Bring your own antenna and enclosure — the reader stack is already running.

Dual QR scanner drivers

Two independent QR scanner interfaces supported. Drop in any compatible optical module — the firmware handles decode, validation, and event dispatch automatically.

Parking Access Control Systems



An Off-grid outdoor Platform for Automated Parking Access Systems with AI functions

Modern automated parking systems require reliable access control, intuitive user interaction, secure connectivity, immediate ticket printing, support for off-grid installations and AI functions like car plate numbers recognition.

Our 7-inch or bigger touch screen module with an embedded AI MCU is designed as a central control and HMI platform for parking access controllers, entry/exit terminals, car plates recognition and payment kiosks. Accelerate Time-to-Market with a Ready-to-Use Control Platform

A Complete Parking Access Solution

By combining:

- **PD.Screen_AI** – control, HMI, connectivity, ticket printing, number plates recognition, voice guidance
- **PD.Charger_GSM** – solar power management, LiFePO₄ / Li-Ion BMS, GSM/GPS, I2C, RS485
- **PD.Cam** – low-power RS-485/I2C camera module for photo and video registering
- **PD.LoRa_Sensor** – Ultra low-power parking space access detector

At the heart of the PD.Screen_AI module is a user-accessible ESP32 MCU which controls AI MCU via API commands, enabling manufacturers to develop parking applications quickly using familiar tools.

PD.Screen_AI - Advantages for real use cases:

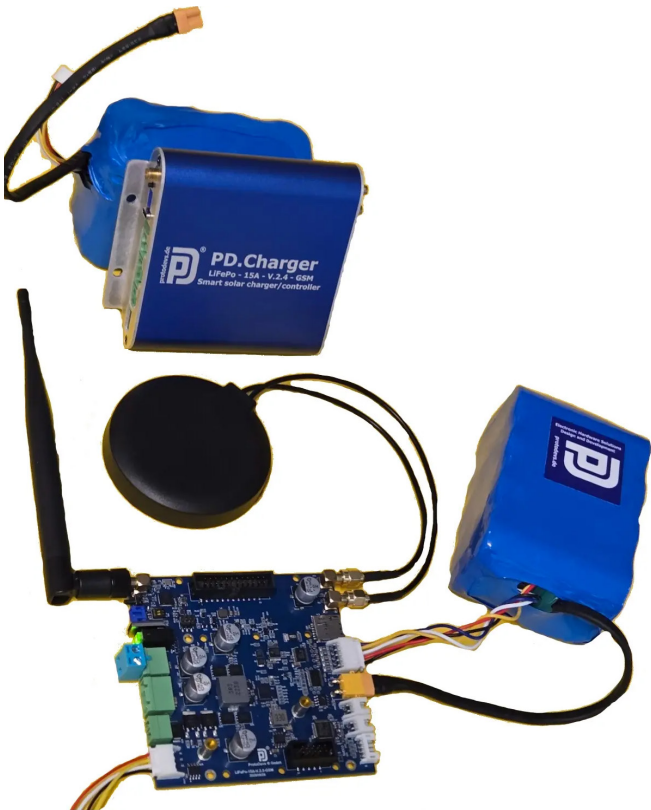
- Voice command understanding
- Intent classification and car plate numbers recognition
- Context-aware UI responses
- Ultra-low latency inference (milliseconds-level response)
- Fully offline operation supported: no cloud, no data leakage

ESP32 for User Applications

Extensive Arduino Example Library Supports Arduino, PlatformIO, MicroPython & Modern Toolchains. This allows rapid prototyping and smooth transition from development to deployment.

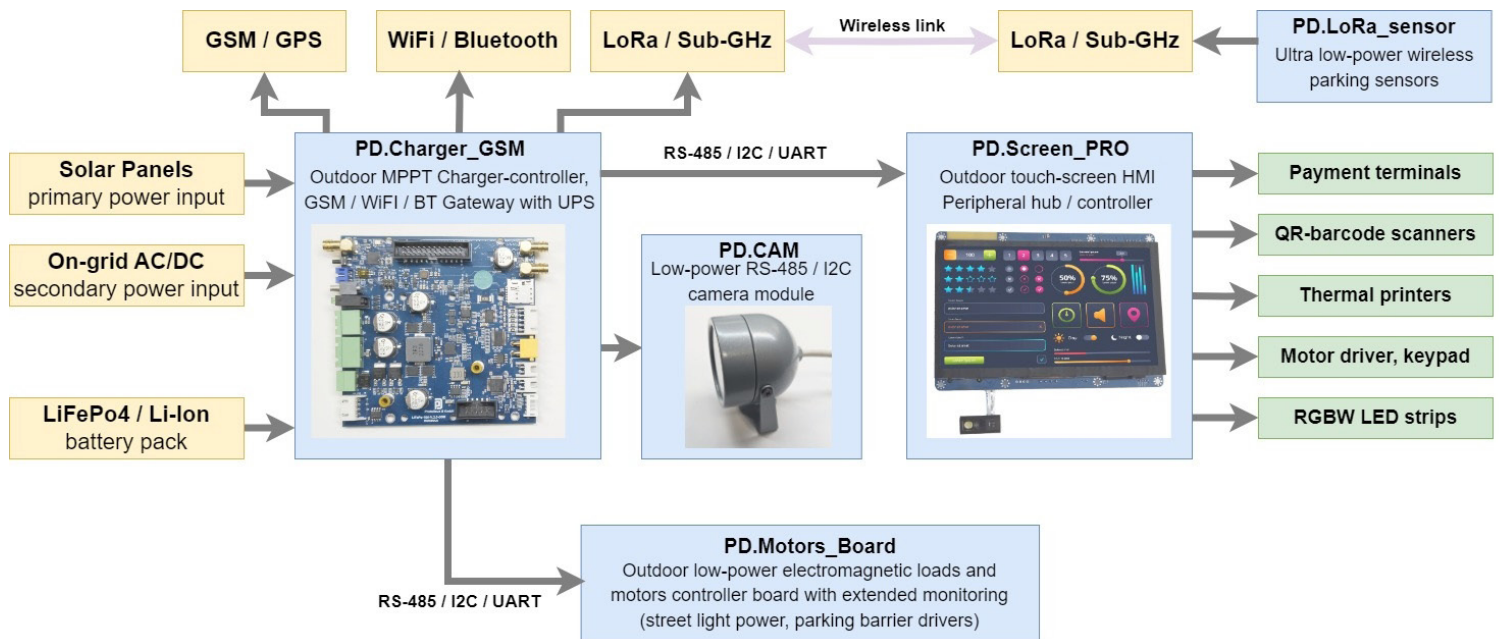
Dual-MCU Architecture – Powerful Yet Simple

- ESP32 – Application & Connectivity MCU
- STM32 – Graphics, Touch & Display Control



An Off-grid outdoor Platform for Automated Parking Access Systems

Parking Access Control Systems



All complex graphics and touch processing are handled internally. The user controls the UI using simple API commands, eliminating the need for advanced graphics programming.

Integrated Thermal Printer Interface

The module includes a direct interface for compact thermal printer modules:

Immediate printing of parking tickets, receipts, QR codes, and validation slips

Intuitive User Interface

The 7-inch / 10-inch TFT touch display supports:

- Access guidance and system messages
- QR-barcode scanners for access triggering
- Ticket and payment confirmation visually and audially
- Branded, customizable UI layouts

Native Control of Parking Hardware

Stepper motor driver for camera positioning
 PWM outputs for signal lights and actuators
 RGBW LED strip and indicator control for system status

Industrial Interfaces for Expansion

Enables seamless integration with parking management platforms, payment systems, and smart-city infrastructure.

- RS-485 for barrier controllers and parking systems add-ons
- I²C & UART for RFID, QR scanners, LPR systems, and sensors
- Ethernet with PoE for fast integration into the existing LAN infrastructure
- Wi-Fi & Bluetooth for MQTT & Secure MQTT (TLS) implementations

Solar-Ready & Off-Grid Parking Systems with PD.Charger_GSM

For parking installations where grid power is unavailable or impractical, we offer PD.Charger_GSM, a dedicated solar power management and connectivity module designed to work alongside the 7-inch / 10-inch PD.Screen_PRO touch screen controller.

Intelligent Solar & Battery Management

PD.Charger_GSM handles all power-related tasks:

- Solar charging management with 2x MPPT inputs (up to 70V)
- Embedded LiFePO₄ or Li-Ion battery charging and protection (up to 100 Ah+)
- Optimized energy usage for 24/7 operation
- Ideal for outdoor, roadside, and remote parking systems

Built-In Wireless Connectivity

In addition to power management, PD.Charger_GSM adds:

- **GSM connectivity** for remote monitoring, alarms, and data transmission
- **GPS positioning** for asset tracking, system identification, and fleet management
- **WiFi / Bluetooth** for custom scenarios
- **LoRa** for parking slots availability detection or custom sensors

Manufacturers can build fully autonomous, solar-powered parking access systems with minimal external components.

One Ecosystem.

Multiple Deployment Scenarios.

From grid-connected parking garages to solar-powered roadside installations.

Smart Silence Pods / Mute rooms

Solution for Smart Silence Pods / Mute rooms

PD.Screen_PRO + PD.Multicontroller + PD.AC_switcher = control all the functions of the Silence Pod from a single Touch Screen

Designing modern Silence Pods requires more than acoustic performance — it requires fast development, secure connectivity, and seamless integration into smart building ecosystems. Our 7-inch / 10-inch touch screen module with special peripheral controller and AC load switcher board are designed to help Silence Pod manufacturers accelerate time-to-market while delivering advanced control and a premium user experience.

PD.Screen_PRO: smart touch-screen MCU computer with a lot of peripherals onboard

PD.Multicontroller: industrial-grade controller for Fans, RGBW LED strips, Locks, power IN/OUT, etc.

PD.AC_switcher: 2x 110V / 230V AC control and monitoring channels (up to 15A switching per channel) to create different scenarios with additional services inside the Pods (massage chair enabling, heater, big TV, coffee machine unlock, etc.)

Faster Time-to-Market with a Ready-to-Use MCU Platform

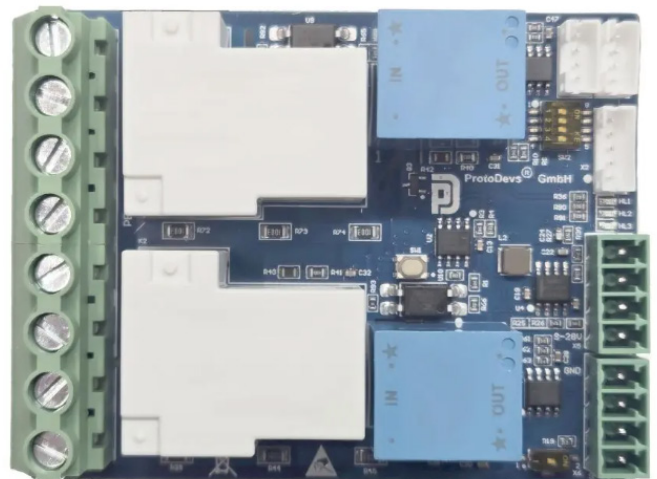
At the core of the Touch Screen (PD.Screen_PRO) module is a user-accessible ESP32 MCU, enabling rapid application development without proprietary tools.

- **ESP32 Available for User Applications:** Implement control logic directly on the ESP32 using familiar development workflows.
- **Extensive Arduino Example Library:** We provide ready-to-use Arduino examples, significantly reducing development time.
- **Multiple Development Environments Supported:** Full support for Arduino, PlatformIO, and other easy-to-use software ecosystems.

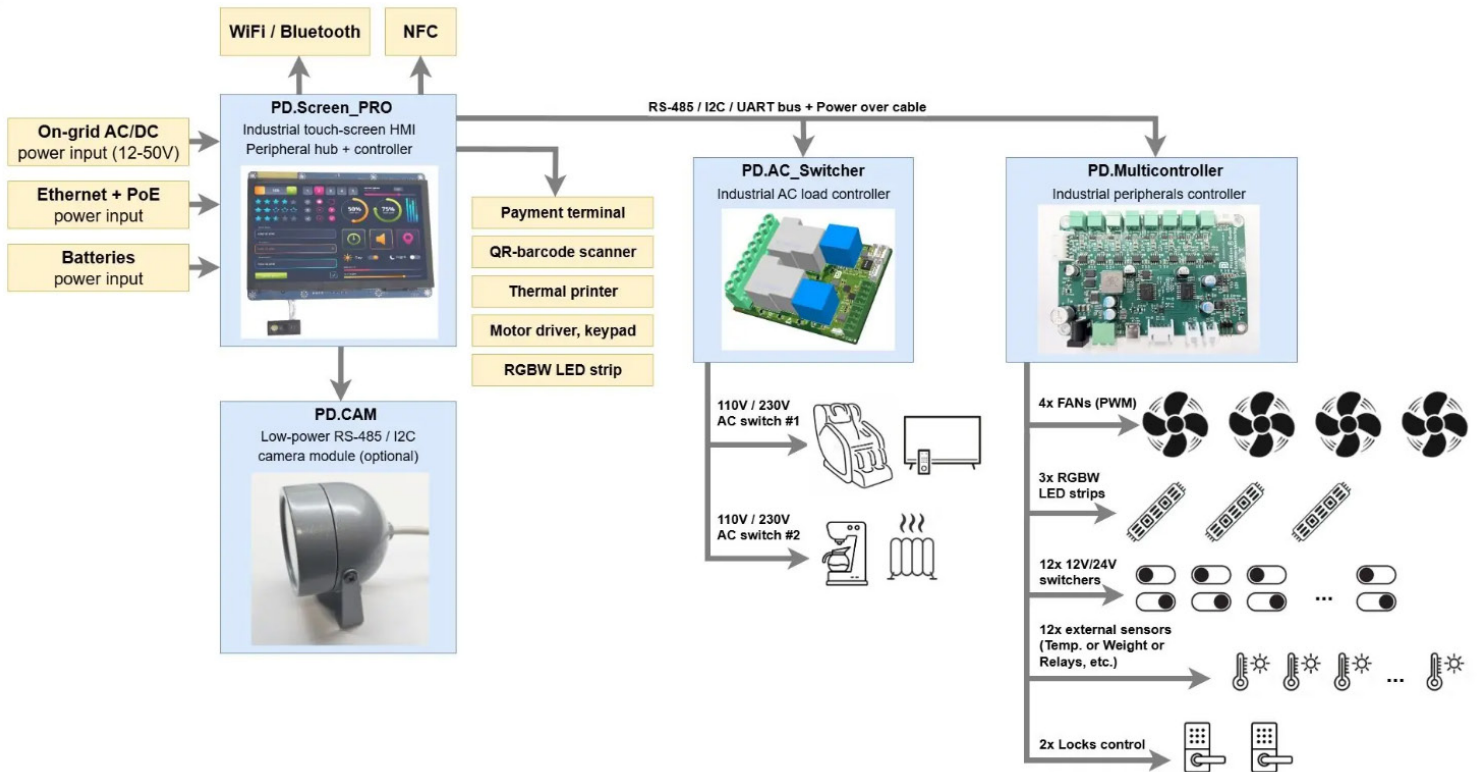
This approach allows manufacturers to move quickly from prototype to production.

Powerful Dual-MCU Architecture in the core – Simplified for the User

The module combines performance with simplicity through a dual-MCU design:



Smart Silence Pods / Mute rooms



- **ESP32** – Application & Connectivity MCU
- High-Performance **STM32** – Graphics & Touch Processing MCU

All complex graphics and touch handling are managed internally by the STM32. The user interacts with the display using simple, high-level API commands from the ESP32—no advanced graphics programming required.

Native Control of Core Pod Functions with PD.Multicontroller

- 4x PWM Fan Control for precise ventilation and noise optimization
- 3x RGBW LED rails for Interior Lighting Control with dimming and scene support
- 1x Stepper Motor Driver Support for motorised vents, blinds, or doors
- 2x electromagnetic locks drivers for doors and shelves access control
- 12x power IN/OUT for different sensors (Temperature, Weight, Contact, etc.)

Industrial Interfaces for Maximum Expandability

- RS485 Interface for robust communication with external controllers, sensors, and BMS systems
- I²C and UART Interfaces for easy connection

of additional controllers, sensors, or custom electronics

- QR-barcode scanner (1D and 2D) for paid access or interactive settings loading from the phone screen
- Modular system architecture that supports future feature expansion without hardware redesign (GPIO expansion slots on the back side of the module)

Built-In MQTT & Secure Cloud Connectivity

To support connected and smart-building-ready Silence Pods, the module includes **native MQTT support** on the ESP32:

- MQTT Communication Examples Provided: Ready-to-use Arduino examples demonstrate how to publish and subscribe to pod data such as fan status, lighting state, sensor values, and usage information.
- Secure MQTT (MQTTS / TLS) Examples Available: We provide examples for encrypted and authenticated MQTT communication, enabling secure integration with cloud platforms and enterprise systems.
- Ideal for Smart Buildings & Fleet Management: Enable remote monitoring, analytics, predictive maintenance, and centralized control of Silence Pod installations.

Industrial Queue & Ticket Management System

Reliable. Instant. Scalable. Built for Real-World Environments.

Our Industrial Queue Ticket System is a production-ready hardware platform designed for organizations that manage customer flow in public, commercial, and industrial environments.

Unlike PC- or Raspberry-Pi-based kiosks, our solution is built on industrial embedded hardware, delivering instant startup, high reliability, and zero filesystem failures, even in outdoor or unattended installations.

What the system solution Is

A fully integrated queue management platform combining:

Industrial Touch HMI Computer (PD.Screen_PRO)

Industrial LiFePO₄ Power & Connectivity Controller (PD.Charger_GSM)

Together, they form a standalone, smart queue terminal that works with or without permanent power or network connectivity.

What the Queue System Can Do

- Issue printed tickets via thermal printer
- Scan QR codes from tickets or mobile phones
- Display queue status, call numbers, and instructions
- Support keypad-based or touch-based input
- Operate online or offline
- Sync with backend systems via:
 - Ethernet
 - WiFi / Bluetooth
 - GSM / LTE
 - RS-485 / I2C / UART / CAN

Our Industrial Approach

Instant Operation

- Boots in **milliseconds**
- Always ready — no OS startup delay
- No OS, No Filesystem
- Immune to power cuts
- No SD card corruption
- Predictable real-time behavior



Multi-Battery Charging & Monitoring

LiFePO₄ & Li-Ion | Scalable | Off-Grid & Grid-Powered

Our Multi-Battery Charging & Monitoring Solution is an industrial platform designed for simultaneous charging, monitoring, and control of multiple LiFePO₄ and Li-Ion batteries from a single setup (1 to 50 batteries at a time), multiple setups could be chained without limits.

The solution is built on two proven industrial modules:

- **PD.Charger (MPPT Solar / DC Smart Charger)**
- **PD.Screen_PRO (Industrial Smart Touch HMI MCU Computer)**

Together, they form a scalable, API-controlled multi-battery charging system capable of managing 1 to 50+ batteries, with individual monitoring, safety control, remote connectivity and the status info logging to the onboard uSD-card to the web-server.

What Problem It Solves

Traditional multi-battery charging systems suffer from:

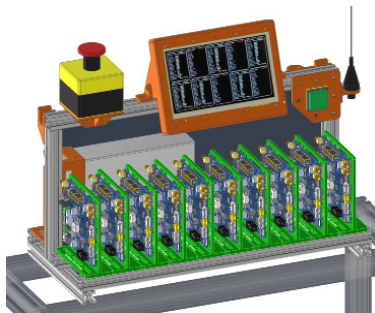
- limited scalability

- no remote monitoring of the charging process
- poor battery health visibility
- no logging to track the batteries during the test and operation
- complex custom firmware and UI development for such a custom systems
- high maintenance cost and long time-to-market

Our solution eliminates these issues by delivering a deterministic, embedded, industrial-grade charging platform that works reliably 24/7 in harsh environments.

Typical Use Cases

- Multi-battery charging stations (1–50+ packs)
- Battery testing & aging labs
- Energy storage systems (ESS)
- EV battery service & refurbishing
- Off-grid solar battery farms
- Telecom & backup power systems
- Industrial battery lockers
- R&D and production test benches



Energy Monitoring and Forecasting

Scalable Energy Monitoring, Management and Consumption Prediction

Empower your business with **PD.Charger** and **PD.Charger-GSM**, cutting-edge solutions for intelligent charging and energy monitoring designed for seamless integration into modern energy infrastructures. Whether you're building and monitoring smart energy systems, managing off-grid installations, or deploying scalable solar projects, our hardware modules and platform combination delivers **precision, reliability, and actionable insight** at every level.

The **PD.Charger** efficiently charges LiIon / LiFePO₄ batteries from solar or any DC power source, while the **PD.Charger-GSM** takes functionality further—featuring **WiFi, Bluetooth, GPS, GSM, UART, I2C and RS485** connectivity to suit a wide variety of industrial and remote applications. Designed for real-world deployment, both models are engineered to operate under harsh conditions with dependable performance.

Backed by our proprietary **Data platform**, every device seamlessly connects to our secure cloud infrastructure. From there, partners gain access to a robust **web-based dashboard** that enables real-time system monitoring, data logging, and advanced analytics—including **energy usage forecasting**. The system is fully scalable, allowing organizations to manage **hundreds or thousands or even more of endpoints** across distributed networks.



For integrators, energy service providers, and OEM partners, our solution could be **precisely customized for any special case**, it is fully documented, and supported by a dedicated technical team. Whether you're enhancing your product line, building energy-as-a-service offerings, or deploying monitoring infrastructure for clients, **PD.Charger and PD.Charger-GSM offer a proven, flexible, and future-ready foundation.**

Batteries charging and remote monitoring

Precision Charging. Complete Visibility. Maximum Efficiency.

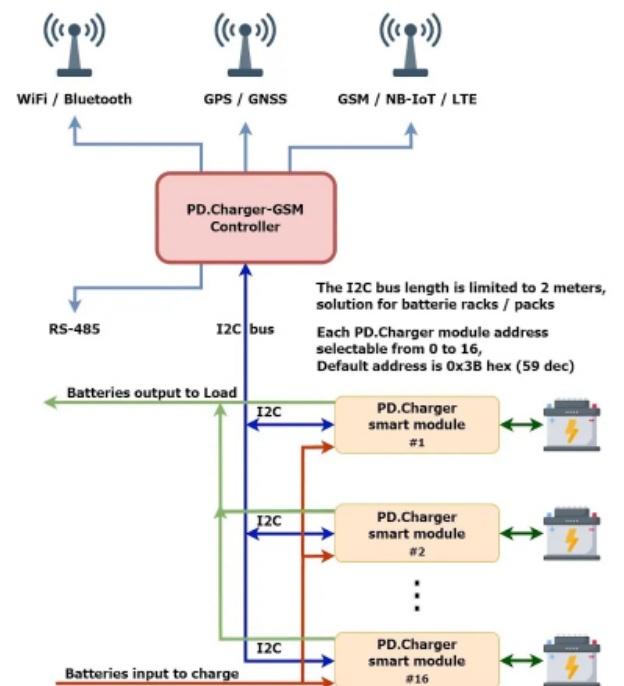
At the heart of PD.Charger and PD.Charger-GSM is a commitment to charging efficiency and system transparency. Designed for both LiFePO₄ and Li-Ion batteries, our devices utilize advanced algorithms to ensure every charge cycle is optimized for maximum energy retention, battery longevity, and safety. Whether it's a compact battery pack or a large-scale energy bank, the charging process is finely tuned for performance and reliability.


Our system goes beyond basic voltage and current regulation. PD.Charger and PD.Charger-GSM offer full-spectrum monitoring of all essential parameters across the entire energy flow—from input to battery to load. This includes:

- **Input Voltage & Current** (from solar or other DC sources)
- **Charging Voltage & Current**
- **Real-time Output Metrics**
- **Battery State of Charge (SOC) & Remaining Capacity**
- **Individual Cell Voltages**
- **Battery Temperature & PCB Temperature**

These parameters are not only measured in real-time but also transmitted securely to our cloud platform, where they can be analyzed, visualized, and logged for audit or optimization purposes.

LiFePo / LiIon batteries monitoring and charging solution (I2C)





**Let's build smarter, cleaner,
and more reliable outdoor solutions —
together.**

