

DOMIBIO

Smart Horticulture Solutions · 设施农业智能化解决方案

Product Solution Brochure

产品方案书

Substrate Weighing & Fertigation Monitor · UV-C Crop Protection Robot

Multi-Zone Irrigation & Crop Protection Management System

基质称重水肥监测系统 · UV-C 植保消杀机器人 · 多首部灌溉植保控制管理系统

www.domibio.cc

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Company Overview 公司概况

DOMIBIO delivers integrated digital-farming solutions for protected horticulture — blueberry, strawberry and specialty crops. We combine agricultural robotics, IoT sensing and centralized control software into a single “digital growing manager” that helps growers cut water and fertilizer use, reduce chemical spraying, and manage more area with fewer people.

DOMIBIO 专注于设施园艺(蓝莓、草莓及经济作物)的数字化种植整体解决方案。我们将农业机器人、物联网传感与集中式控制软件融为一体,打造“数字化种植管家”——帮助种植者节水节肥、减少化学农药喷施,并以更少人力管理更大面积。

Our three flagship products can be deployed independently or as one connected platform:

三款主力产品既可单独部署,也可组网成为一体化平台:

- Substrate Weighing & Fertigation Monitor — precise water/fertilizer control by real-time substrate weight.

基质称重水肥监测系统 —— 通过实时基质重量精准调控水肥。

- UV-C Crop Protection Robot — chemical-free disease suppression by autonomous UV-C treatment.

UV-C 植保消杀机器人 —— 自主 UV-C 处理,无化学药剂抑制病害。

- Multi-Zone Irrigation & Crop Protection Management System — one platform to schedule, monitor and control the whole farm.

多首部灌溉植保控制管理系统 —— 一个平台完成全场排程、监控与控制。

The Grower's Challenge & Our Value 种植痛点与产品价值

Protected horticulture faces rising labor cost, unpredictable disease pressure, and water/fertilizer waste from manual, experience-based decisions. DOMIBIO turns these guesses into data.

设施园艺正面临人工成本上升、病害压力不可控、以及凭经验人工决策导致的水肥浪费。DOMIBIO 把“凭感觉”变成“靠数据”。

Save water & fertilizer 节水节肥	Up to ~30% reduction in water/fertilizer through weight-based drainage control. 基于排液率的称重控制,水肥用量最高可降约 30%。
Fewer sprays 减少打药	UV-C treatment can cut chemical spraying by 3–5 rounds per season, lowering powdery mildew & botrytis pressure. UV-C 处理每季可减少 3–5 遍化学喷药,降低白粉病、灰霉病压力。
Less labor 节省人力	One operator can manage 100+ mu (≈6.7 ha) from a phone. 一人即可通过手机管理 100 亩以上。
Better quality 提升品质	Stable root-zone environment and lower residue improve yield and grade. 根区环境稳定、残留更低,提升产量与商品等级。
Full traceability 全程可追溯	Every irrigation, treatment and alarm is logged for food-safety and export compliance. 每次灌溉、处理与报警全部留痕,满足食品安全与出口合规。

Typical payback period: 12–18 months. 典型投资回收期:12–18 个月。

Product 1 · Substrate Weighing & Fertigation Monitor 产品一 · 基质称重水肥监测系统

What it does 功能简介

A gravimetric monitoring station continuously weighs the growing substrate (bag/pot/gutter) to know exactly how much water the crop has taken up and drained. It closes the loop with solenoid valve control so irrigation matches real plant demand — not a fixed timer.

称重式监测站持续称量栽培基质(袋/盆/槽)重量,精准掌握作物吸水与排水量,并联动电磁阀控制,使灌溉匹配作物真实需求,而非固定定时。

Key features 核心特点

- Real-time drainage-rate (排液率) control via precision load cells.
高精度称重传感器,实时监控排液率。
- Multi-parameter root-zone sensing: 7-in-1 soil probe (moisture, EC, temp, pH, N-P-K) on RS485 / Modbus RTU.
多参数根区监测:七合一土壤探头(水分、EC、温度、pH、氮磷钾),RS485 / Modbus RTU 总线。
- Solenoid valve control for automatic irrigation dosing.
电磁阀控制,自动定量灌溉。
- Cloud dashboard (MQTT + time-series DB) with phone alerts and historical curves.
云端看板(MQTT + 时序数据库),手机报警与历史曲线。
- Industrial ESP32-S3 controller, solar/PoE options, field-hardened enclosure.
工业级 ESP32-S3 控制器,支持太阳能/PoE 供电,户外加固外壳。

Specifications 技术规格

Controller 主控	ESP32-S3 (16MB flash / 8MB PSRAM), industrial grade ESP32-S3(16MB/8MB),工业级
Bus / Protocol 总线/协议	RS485, Modbus RTU (7-in-1 soil sensor + weighing scale) RS485、Modbus RTU(七合一土壤探头 + 称重模块)
Weighing 称重	Precision load cell, gravimetric mass-balance drainage method 高精度称重传感器,重量质量平衡法测排液
Control output 控制输出	Solenoid valve driver (relay), expandable channels 电磁阀驱动(继电器),通道可扩展
Connectivity 通讯	Wi-Fi / 4G to cloud (Mosquitto + TimescaleDB + FastAPI) Wi-Fi / 4G 上云(Mosquitto + TimescaleDB + FastAPI)
Frontend 前端	React web dashboard, mobile responsive React 网页看板,移动端自适应

Product 2 · UV-C Crop Protection Robot 产品二 · UV-C 植保消杀机器人

What it does 功能简介

An autonomous ground robot that drives greenhouse rows at night, applying calibrated UV-C light to crop canopy to suppress fungal pathogens (powdery mildew, botrytis) — a proven, chemical-free method that reduces spray frequency and residue.

自主地面机器人,夜间沿温室行间行走,对作物冠层施加标定 UV-C 光照,抑制真菌病害(白粉病、灰霉病)。此为成熟的无化学方法,可降低喷药频次与农残。

Key features 核心特点

- Autonomous navigation: HSV vision + RPLIDAR fusion, IMU-assisted heading.
自主导航:HSV 视觉 + 激光雷达融合,IMU 辅助航向。
- Robust unstuck / recovery state machine for uneven greenhouse floors.
多级脱困状态机,适应温室不平地面。
- Calibrated UV-C dosing tuned per crop for efficacy without leaf damage.
按作物标定 UV-C 剂量,既有效又不伤叶。
- Web control UI with live status (Flask + SSE), scheduled night runs.
网页控制界面(Flask + SSE)实时状态,夜间定时作业。
- Runs unattended — one robot covers rows every night, replacing repeated manual spraying.
无人值守——单机每夜巡行,替代重复人工喷药。

Specifications 技术规格

Compute 计算平台	NVIDIA Jetson Nano, ROS NVIDIA Jetson Nano,ROS
Sensing 感知	RGB camera (HSV), RPLIDAR A1, 9-axis IMU (BNO085) RGB 相机(HSV)、RPLIDAR A1 激光雷达、九轴 IMU(BNO085)
Treatment 处理方式	UV-C emitter array, crop-calibrated dose & travel speed UV-C 灯阵,按作物标定剂量与行进速度
Navigation 导航	Vision + LiDAR fusion, 9-level unstuck recovery 视觉 + 激光雷达融合,9 级脱困恢复
Control 控制	Web UI (Flask + SSE), scheduled autonomous runs 网页界面(Flask + SSE),定时自主作业
Operation 作业方式	Night operation, unattended, rechargeable 夜间无人作业,可充电

Product 3 · Multi-Zone Irrigation & Crop Protection Management System 产

品三 · 多首部灌溉植保控制管理系统

What it does 功能简介

The central brain of the farm. It coordinates multiple irrigation head-units (首部) across zones, schedules fertigation and crop-protection tasks, aggregates sensor and robot data, and gives the grower one screen to run everything with full logging and alarms.

整座农场的“大脑”。统一协调多个灌溉首部与分区,排程水肥与植保任务,汇聚传感器与机器人数据,让种植者用一块屏幕管理全场,并具备完整日志与报警。

Key features 核心特点

- Multi-head-unit, multi-zone irrigation scheduling and control.
多首部、多分区灌溉排程与控制。
- Integrates substrate monitors, UV-C robots and valves into one dashboard.
将基质监测、UV-C 机器人与阀门集成到统一看板。
- Rule-based automation: irrigate by drainage rate, EC, weather, time windows.
基于规则的自动化:按排液率、EC、天气、时段灌溉。
- Role-based access, task logs, and full traceability for export compliance.
分角色权限、任务日志、出口合规全程可追溯。
- Deployable on-premise or self-hosted cloud; remote access via secure tunnel.
支持本地部署或自托管云端;安全隧道远程访问。

Specifications 技术规格

Architecture 架构	FastAPI backend + React frontend, time-series database FastAPI 后端 + React 前端,时序数据库
Field control 现场控制	PLC / embedded head-unit controllers (Modbus) PLC / 嵌入式首部控制器(Modbus)
Integration 集成能力	Substrate monitors, UV robots, solenoid valves, weather 基质监测、UV 机器人、电磁阀、气象数据
Deployment 部署	On-premise or self-hosted cloud (VPS), secure remote tunnel 本地或自托管云端(VPS),安全远程隧道
Multi-language 多语言	Chinese / English / Thai UI 中文 / 英文 / 泰文界面

One Connected Platform 一体化平台

Bought separately, these are devices. Deployed together, they become a solution — the substrate monitor tells the system what the crop needs, the management system opens the right valves at the right zones, and the UV-C robot keeps disease down without chemicals. Everything reports to one dashboard.

单独购买是设备,组网部署即成方案:基质监测告诉系统作物需要什么,管理系统在对的分区开对的阀,UV-C 机器人无化学地压制病害——一切汇入同一看板。

Layer 1 · Sense 第一层 · 感知	Substrate weighing + 7-in-1 soil sensing → know real demand 基质称重 + 七合一土壤监测 → 掌握真实需求
Layer 2 · Decide 第二层 · 决策	Management system applies rules & schedules 管理系统执行规则与排程
Layer 3 · Act 第三层 · 执行	Valves irrigate + UV-C robot treats 阀门灌溉 + UV-C 机器人处理
Layer 4 · Trace 第四层 · 追溯	Every action logged for compliance & optimization 所有动作留痕,合规并持续优化

Engagement Models 合作模式

- Equipment purchase — buy hardware + software licence outright.
整机采购 —— 一次性购买硬件 + 软件授权。
- Per-area subscription — pay by mu/hectare per year, low entry cost.
按亩订阅 —— 按亩/公顷/年付费,入门成本低。
- Pilot / demonstration base — reference deployment with shared data.
示范基地 —— 标杆部署,数据共享。
- Channel & distribution — for agri-service companies and dealers.
渠道分销 —— 面向农服公司与经销商。

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— *Grow smarter, spend less. 精准种植, 降本增效。* —