Ir. Adrian A. Firmansyah, S.T., M.T.

Technical Director · Industrial Automation, SCADA & IIoT for Palm Oil Mills and Water Treatment

Medan, North Sumatra, Indonesia / +62 811 353520 / adrian@firmansyah.co / linkedin.com/in/adrianaryaputra / firmansyah.co

PROFESSIONAL SUMMARY

Technical Director and electrical engineer (Ir., M.T.) based in Medan, specializing in automation, SCADA and Industrial IoT for palm oil mills (PKS), municipal water treatment plants and process industries. Hands-on across every layer: field instrumentation, PLC logic, satellite and cellular telemetry, and executive dashboards, plus in-house sensing hardware. Key work includes the PTPN IV enterprise SCADA (MIMS) scaled from 12 to 71 palm oil mills, SCADA and analyzer systems at five PDAM Tirtanadi treatment plants including the Rp 61.88B IPAM Sunggal 500 L/s uprating, and a proprietary smart lightning monitoring product running at 7 mills (6 more planned for 2027). 35+ delivered automation projects since 2018, through Xtend and his own practice, Firmansyah.co.

COMPETENCIES BY LAYER

04	**Screen**	Dashboards and reporting: Grafana, Apache ECharts, Xtend Cloud HMI. Software: Python (FastAPI, Celery, TimescaleDB), PHP (Laravel), TypeScript (React).
03	**Telemetry**	Modbus TCP / Modbus RTU (RS-485), OPC-UA, MQTT, industrial Ethernet, RTU telemetry, IoT gateways, VSAT satellite and 4G/LTE links.
02	**Logic**	Siemens S7-1200 / S7-300 (TIA Portal), Schneider Electric Modicon M221, CODESYS (IEC 61131-3), Omron (CX-Programmer), Schneider Vijeo Designer HMI, fail-safe interlocks and permissive logic, 3-element boiler drum control, FAT/SAT, MATLAB/Simulink.
01	**Field**	Instrumentation: electromagnetic flowmeters (DN 600 mm), pressure transmitters (4–20 mA HART, 0–15 bar), ultrasonic and hydrostatic level transmitters, water quality analyzers (pH, conductivity, turbidity, residual chlorine), chemical dosing. Drives: VFDs, Nidec Unidrive M701, Control Techniques Mentor DC drives, digital lock line-shafting (<5 ms), closed-loop vector control, flying shear / cut-to-length, decanter inverter control with automatic CIP. In-house hardware: sensing circuit and panel design, analog front-end sensing, lightning current (kA) and grounding resistance (Ω) monitoring, C/C++ firmware.

EXPERIENCE

Xtend Integrasi Indonesia — Medan, Indonesia — May 2022 - Present

Technical Director Sep 2025 – Present

- Lead engineering strategy and delivery across palm oil mill telemetry, water utility automation and manufacturing projects.
- Designed the edge-to-cloud SCADA connecting 71 palm oil mills across Indonesia to PTPN IV head office, replacing next-day manual reports with automatic per-second data acquisition and on-demand reports from the MIMS portal.
- Supervised the post-flood recovery of PT Intibumi Alumindotama Industry after the December 2025 flash flood, overhauling 7T/15T annealing ovens (Siemens TIA V19), a high-speed Nidec M701 cut-to-length line and 8 punch presses, restoring full production within 14 weeks with zero safety incidents.
- Lead product development of an in-house smart lightning arrester and grounding monitoring system (hardware and firmware), operating at 7 PTPN IV palm oil mills, with 6 more planned for 2027.

Principal Electrical Engineer May 2022 – Sep 2025

- Supervised the first PTPN IV MIMS rollout: hybrid SCADA with CODESYS PLCs, Modbus/OPC-UA/MQTT and VSAT links across 12 palm oil mills.
- Supervised an automated 4-chemical closed-loop dosing system with inline pH and conductivity instrumentation at PTPN IV PKS Tandun, holding dosing within ±0.1 pH to prevent boiler tube scaling.
- Led the Sinarmas Lubukgaung low-pressure boiler control retrofit (Siemens 3-element PID; Xtend as subcontractor to Mechmar) and supervised the SGN PG Rendeng batch centrifugal retrofit (Omron PLC, dynamic braking).
- Design engineering for the Rp 61.88B PDAM Sunggal 500 L/s uprating (Xtend as subcontractor to PT Karya Sepakat Kita): instrument loops, AutoCAD Electrical schematics and FAT/SAT.
- Managed execution of electrical, instrumentation and control packages across PDAM Tirtanadi treatment plants: led Hamparan Perak and Limau Manis, supervised Martubung.
- Directed field wiring audits, transmitter calibrations and PLC logic validation across PDAM treatment plant packages.
- Engineered centralized SCADA architectures and field instrumentation loops for PDAM Tirtanadi IPA Sunggal (500 L/s) and IPA Deli Tua municipal water treatment plants, with analyzers holding treated water below 2 NTU and interlocks that stop distribution pumps above 5 NTU.
- Programmed Schneider Electric Modicon M221 PLC routines and Modbus TCP telemetry networks, establishing 24/7 automated pump control and remote monitoring.

Firmansyah.co — Indonesia — Mar 2019 - Present

Independent Automation Consultant Alongside employment

- Own projects and subcontracts for PT GEA Westfalia Separator, PT Apikon, PT Prima Tetap Jaya and Mechmar: legacy controller migrations (PMO4150 to Siemens S7-1200; Palmmaster 5000 SSR to ABB), a new decanter control panel with automatic CIP, and PLC modernization at PKS Sei Silau.
- Engineered synchronized dual-motor DC drive systems using digital lock electronic line-shafting (<5 ms per degree of error) for commercial printing lines.
- Designed custom embedded timing systems for speed slalom skating with 1 ms precision, at lower cost than imported timing gates.

Earlier engineering and R&D appointments — Surabaya & Bandung, Indonesia — 2018 - 2024

- **Research Staff Member (part-time)**, ITS Control System (2023–2024): developed cascaded EKF sensor fusion (IMU/GNSS/camera) for autonomous electric vehicles; authored an IEEE paper and a reference book.
- **Software Developer (part-time)**, PT Infoglobal (2018–2020): engineered radar CFAR detection and PDAF tracking in MATLAB/Python (IEEE author).
- **Control Systems Engineering Intern**, PT Dirgantara Indonesia (2019): modeled closed-loop actuator control in MATLAB/Simulink.

SELECTED PROJECTS

PTPN IV · Proprietary smart lightning tower, sensing panel and MIMS SCADA integration Jan 2026 – Present
Technical Director / Product Designer (hardware and firmware)
`Custom AFE sensing circuit · C/C++ firmware · kA sensing · ground/loop Ω · MQTT · VSAT`
Designed proprietary analog front-end sensing hardware and C/C++ firmware measuring lightning peak current (kA), strike timestamps and ground resistance, with telemetry into the corporate SCADA over VSAT. Logs grounding resistance every second and counts strikes, so stolen or degraded grounding is caught early. Operating at 7 palm oil mills, where surge damage has dropped sharply; 6 more mills planned for 2027.

PTPN IV head office · Enterprise SCADA / MIMS integration (71 palm oil mills across Indonesia) Jun 2025 – Present
Enterprise SCADA Architect
`Xtend gateways · Python · Celery · TimescaleDB · Grafana · React · VSAT/cellular`
Deployed edge gateways sending telemetry over VSAT/cellular, Python/Celery ingestion into TimescaleDB, and Grafana/React dashboards, putting all 71 mills on one corporate SCADA view and moving from next-day reports to per-second data with reports downloadable on demand.

PDAM Tirtanadi IPAM Sunggal · SCADA and instrumentation uprating 500 L/s (Rp 61.88B project) Jun 2024 – Jun 2025
Design Engineer (Xtend as subcontractor to PT Karya Sepakat Kita)
`Schneider M221 · Vijeo · CODESYS · DN 600 flowmeter · HART`
Design engineering of PLC/SCADA and instrumentation for the 500 L/s capacity uprating serving the Medan metropolitan area: Schneider M221 PLCs, Vijeo Designer HMIs, DN 600 mm electromagnetic flowmeters, pressure and level transmitters, and multi-stage FAT/SAT commissioning.

PDAM Tirtanadi · SCADA, water quality analyzers and pump control (Sunggal, Deli Tua, Martubung, Hamparan Perak, Limau Manis) 2022 – 2025
Lead engineer (Sunggal offtake, Deli Tua, Hamparan Perak, Limau Manis) / Supervisor (Martubung, Lhoksukon)
`Schneider M221 · CODESYS · Modbus TCP · MQTT/OPC-UA HMI · Laravel/Angular · PostgreSQL`
Delivered intake, offtake, raw- and treated-water analyzer (turbidity, pH, conductivity, residual chlorine), pump control and flocculation/sedimentation/filter automation packages across five Medan-area treatment plants, plus PDAM Tirta Mon Pase IPAM Lhoksukon (Aceh). Distribution pumps stop automatically above 5 NTU; since go-live, no turbid water has reached customers.

PT Intibumi Alumindotama Industry · Post-flood recovery Jan 2026 – Apr 2026
Technical Director (supervision)
`Siemens TIA Portal V19 · PID_Temp · Nidec Unidrive M701 · flying shear CTL · closed-loop vector`
Supervised the rewiring and re-engineering of a flood-submerged plant: 7T/15T annealing ovens (Siemens PID_Temp, ±1.0 °C), flying-shear cut-to-length line (Nidec M701, under ±0.5 mm), slitting line and 8 punch presses. Full production restored within 14 weeks with zero safety incidents.

Sinarmas Ivo Mas Lubukgaung · Low-pressure boiler control system modernization Jun 2025
Lead Engineer (Xtend as subcontractor to Mechmar)
`Siemens TIA Portal V11 · S7-300 / S7-1200 · 3-element boiler drum PID · inverter draft fan modulation`
Implemented 3-element feedwater PID control (drum level, steam flow, feedwater flow) and inverter-driven forced/induced draft fan modulation on Siemens S7 to stabilize steam pressure and prevent carryover.

PT Sinergi Gula Nusantara (SGN) PG Rendeng · High-grade sugar centrifugal modernization (3 units) Mar 2025
Supervisor
`Omron PLC (CX-Programmer) · high-inertia centrifugal drives · dynamic braking · discharger sequencing`
Supervised re-engineering of Omron PLC acceleration profiles, wash timing, dynamic braking and plow discharger interlocks on 3 high-grade batch centrifugals, eliminating drive braking fault trips.

Standard Chartered Bank branch office Medan · Building management system (BMS) Nov 2025
Technical Director / Design Engineer
`AutoCAD Electrical · VRV/HVAC · chiller staging · UPS telemetry · water leak probes · Xtend Cloud`
Engineered distribution panels in AutoCAD, ATS/AMF generator transfer, VRV/HVAC chiller staging, UPS monitoring and leak detection integrated to Xtend Cloud, designed to the client's 99.99% utility uptime requirement.

EDUCATION

Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia

Professional Engineer Program (Program Profesi Insinyur, Ir.), Electrical Engineering · GPA 3.92 / 4.00 — 2025

Master of Engineering (M.T.), Electrical and Electronics Engineering · GPA 3.86 / 4.00 · Research: multi-sensor fusion for autonomous vehicles — 2020 – 2024

Bachelor of Engineering (S.T.), Electrical and Electronics Engineering · GPA 3.45 / 4.00 · Lab assistant coordinator, Control & Automation Laboratory; research assistant, System & Cybernetics Laboratory — 2016 – 2020

CERTIFICATIONS

Insinyur (Ir.) professional degree · Program Profesi Insinyur, Institut Teknologi Sepuluh Nopember (ITS) — 2025

Certified IoT Platform Engineer · Badan Nasional Sertifikasi Profesi (BNSP) — Jun 2025 – Jun 2028

Certified IoT Device Engineer · Badan Nasional Sertifikasi Profesi (BNSP) — Jun 2025 – Jun 2028

TOEFL ITP (score 613) · ETS, credential ID 846884 — Aug 2025 – Aug 2028

PUBLICATIONS AND LEADERSHIP

- **Book:** Sensor Fusion: Persepsi Internal Dan Eksternal Kendaraan Otonom, Deepublish, ISBN 978-623-02-9315-3 (2024).
- **IEEE conference paper:** Enhancing Autonomous Ground Vehicle Positioning and Navigation through Cascaded Multi-Sensor Integration, IEEE ICAMIMIA, DOI 10.1109/ICAMIMIA60881.2023.10427562 (2024).
- **IEEE conference paper:** Comparison of CFAR Methods on Multiple Targets in Sea Clutter Using SPX-Radar-Simulator, IEEE ISITIA, DOI 10.1109/ISITIA49792.2020.9163697 (2020).
- **Leadership:** Local Vice President, JCI Chapter Medan (2026 – present) · Wakil Bendahara Umum, Forum Insinyur Muda Persatuan Insinyur Indonesia (FIM-PII) Sumut (2025 – present).