PART II — ENGLISH ROLE PROFILE

1. Role Purpose

This role provides technical ownership of one selected engineering discipline within MET's industrial automation, robotic-cell and special-purpose machine projects—from requirements and design/programming through integration, testing, site commissioning and handover. The objective is not merely to write code or draw schematics: it is to deliver a working, safe, diagnosable and maintainable system.

Specialisation and seniority

Robotics, PLC/motion, and Electrical System Design are separate career tracks. Candidates are not expected to master all three. The depth of independent responsibility depends on demonstrated work and the scope of the assigned project.

2. Scope of the Role

- Convert customer and project needs into measurable requirements covering cycle time, throughput, quality, operator access, machine safety, maintenance and fault recovery.
- Develop an appropriate technical architecture within the selected track and agree cross-discipline I/O, wiring, data, coordinate and software interfaces.
- Validate engineering assumptions against physical equipment; produce test evidence from simulation, bench testing and customer-site acceptance.
- Escalate hazards, uncertainties and safety-related changes early rather than applying unapproved modifications.
- Work with mechanical and panel-assembly teams to keep drawings, symbols, cabinet wiring and the actual machine aligned.
- Prepare version-controlled design/software files, I/O and alarm lists, test results, as-built documentation and commissioning notes.
- Review supplier datasheets, compare technically suitable alternatives and support parts/BOM decisions without assuming purchasing authority.
- Participate in FAT/SAT, customer technical discussions, site commissioning and appropriate service/fault investigations.

Ownership Model

An engineer owns the defined technical deliverables in their specialty, not the entire work of the other disciplines by default. System safety approval, procurement, final release and customer acceptance follow MET's delegated authorization process.

3. Core Responsibilities — A | Robotics

3.1 Robot Programs and Cell Cycles

- Define controller states from power-up to ready/automatic/manual/fault/controlled stop; design external start, busy, done, hold and reset handshakes.
- Teach and verify TCP, tool and user/workpiece frames; test approach/retreat paths, speed, payload and robot configuration on the actual cell.
- Implement recipe or part-specific target selection for pallets, vertical magazines and variable product geometries using clearly defined counters and position data.

3.2 Machine Vision, Offsets and Product Variants

- Define reference capture poses and camera/robot/workpiece relations for fixed-camera and robot-mounted camera applications.
- Maintain part-specific references for different lengths and corner geometries; apply measured X/Y and angular corrections in the appropriate workpiece/placement frame.
- Document invalid detections, calibration drift, gripper alignment, robot reach and conditions for retry or safe rejection.

3.3 Safety, Fault Recovery and Homing

- Differentiate recovery when a part is confirmed gripped versus when the gripper is empty; verify actual sensor, step and workholding state first.
- Complete an interrupted operation only when safe and validated; otherwise define a safe hold/supervised recovery and collision-free return-to-home path.
- Verify pallet-zone interlocks and operator access restrictions together with the PLC and machine-safety specialists.

3.4 Robotics Deliverables

Backed-up and identified robot program; frame/TCP/calibration records; I/O handshake map; cycle/alarm-state description; cycle-time and recovery test results; offline simulation evidence when relevant.

Illustrative tools: FANUC TP/KAREL, ROBOGUIDE, iRVision, PalletPRO/PalletTool and equivalent industrial controllers/simulation platforms. No single brand list is mandatory for every applicant.

3. Core Responsibilities — B | PLC and Motion Control

3.5 PLC Software Architecture

- Implement readable state machines or sequence logic for automatic/manual modes, interlocks, sensor confirmation, timeouts, fault codes and safe restarts.
- Define physical and symbolic I/O, device ownership and robot/PLC handshakes, including fieldbus timeout and reconnection behavior.
- Create maintainable, testable and reusable function blocks in LAD/FBD/SCL or equivalent IEC 61131-3 programming languages.

3.6 Servos, Conveyors and Fast Events

- Integrate homing, limits, positioning, stop and fault recovery for servo/VFD-driven axes using suitable motion objects and blocks.
- Select encoder/high-speed input paths based on product dimensions, conveyor speed, detection windows and PLC scan time; use hardware capture where necessary.
- Verify actual move-complete conditions and interpret position, speed, torque, ready and safety-related feedback correctly.

3.7 HMI, Communications and Diagnostics

- Develop usable operation modes, recipes, alarms, histories, trends, maintenance screens and access controls in HMI/SCADA environments.
- Define network telegrams/data maps and heartbeat/timeout handling for PROFINET, EtherNet/IP, Modbus, OPC UA or other relevant protocols.
- Investigate rare faults through event capture, timestamped logs, traces and data history rather than relying solely on an engineer’s live laptop connection.

3.8 PLC Deliverables

Versioned PLC/HMI project; I/O and network map; sequence diagram; alarm/interlock list; servo commissioning settings; functional/negative test evidence; back-up and restore instructions.

Illustrative tools: Siemens S7-1200/1500, TIA Portal, WinCC, standard motion control blocks, or equivalent PLC/HMI/motion platforms. Familiarity with every named product is not required.

3. Core Responsibilities — C | Electrical System Design

3.9 Power, Control and I/O Schematics

- Prepare single-line and detailed schematics for power distribution, motors, VFDs/servos, 24 VDC, PLC I/O, sensors, actuators and safety-related devices.
- Collect design inputs and perform suitable checks for current, voltage, cable sizing, protective devices, prospective faults and isolators before final selection.
- Maintain consistent device tags, terminal/cable identification, page cross-references and connection lists using EPLAN, AutoCAD Electrical or equivalent CAD.

3.10 Cabinets, EMC, Earthing and Service

- Evaluate cabinet layout, thermal dissipation, space, channels, accessibility, maintainability, enclosure/environmental ratings and field cable entries.
- Address protective earthing, shielding, power/signal segregation and noise from VFD/servo wiring; review network topology and termination.
- Prepare controlled BOMs and technical selection evidence for protective devices, supplies, safety components, PLC/remote I/O, drives, terminals and connectors.

3.11 Verification and Change Control

- Check assembly against schematics and record discrepancies and approved field modifications in as-built drawings.
- Prepare verification plans with authorized personnel for continuity, protective conductors, insulation and functional testing, using equipment-specific procedures and limits.
- Support machine-safety design and verification with the relevant specialists without claiming independent approval beyond assigned authority.

3.12 Electrical Deliverables

Controlled CAD project; single-line/power/control schematics; panel layout; terminal/cable/I/O lists; BOM and manufacturer technical evidence; earthing/shielding notes; as-built and test records.

The applicable machine-electrical and safety requirements are selected based on project context, destination country and delegated compliance responsibilities.

4. Shared Work: Integration, Verification and Handover

4.1 Interfaces and System Architecture

- Build one agreed signal dictionary across robot, PLC, electrical and mechanical teams: ownership, normal/fault behavior, reset logic, physical link and timeout.
- Document a clear architecture so that field devices, drawing references, software tags and HMI messages correspond unambiguously.
- Agree safety zones, moving-axis restrictions and maintenance/service boundaries with machine-safety specialists.

4.2 FAT, SAT and Commissioning

- Prepare I/O, alarm, manual/auto, safety-function, power-up and recovery test coverage before factory acceptance.
- Demonstrate throughput, quality, repeatability, long-run stability and cycle-time requirements using recorded measurements.
- Separate electrical, network, software, mechanical and process causes on site; do not treat a temporary bypass as a permanent corrective action.

4.3 Troubleshooting and Continuous Improvement

- Capture logs/trends/traces where possible and distinguish symptoms, triggers, root causes, corrections and preventive measures.
- Follow up every field change with updates to affected code, drawings, parameter files, backups, test cases and operator instructions.

4.4 Documentation and Cross-Checks

- Cross-check I/O maps and cabling against PLC tags/data blocks, robot registers and HMI alarm IDs.
- Store software/drawing versions and configuration backups; document known limitations, open actions and service/maintenance handover.

Safety boundary

Unauthorized live electrical measurement, uncontrolled entry into a robot work envelope and bypassing safety functions are not acceptable. Risk assessment, approved procedures, isolation and delegated competency govern hazardous work.

5. Typical Daily, Weekly and Project-Cycle Activities

Cadence	Typical activities
Daily	Code/drawing and device checks; resolving workshop/site issues; program or design review; updating open faults and risks.
Weekly	Integration/interface review; I/O checks; FAT/SAT planning; revision and backup checks; procurement or schedule risk review.
At project gates	Requirements → architecture → detailed engineering/programming → manufacture/assembly → bench/FAT → SAT → as-built → handover.
As required	Supplier/customer discussion; fault response; operator training; re-testing and technical reports at site.

6. Expected Deliverables

Robotics Track

- Robot code and backup; frame/TCP data; cycle and homing strategy.
- Robot–PLC handshake; camera/offset validation; cycle-time and recovery test evidence.

PLC and Motion Track

- Version-controlled PLC/HMI code and comments; I/O/fieldbus or telegram map.
- Alarm/interlock schedule, axis settings, functional tests and fault logging/diagnostics plan.

Electrical Track

- Schematic package, panel layout, cable/terminal lists, component selections and up-to-date BOM.
- As-built, measurement/test records, revision log and commissioning support note.

Shared Across Tracks

- Open issues, risks and actions; measured verification results and customer acceptance records.
- Maintenance/user documentation inputs and R&D/engineering reporting where applicable.

7. Decision Rights and Boundaries

Area	Engineer contribution	Approval / escalation
Technical solution	Designs options, implements and validates within assigned domain.	Critical system or safety decisions require technical/project approval.
Software/drawing release	Prepares revisions and associated verification evidence.	Final controlled release follows the organization's approval process.
Components	Provides engineering comparisons and BOM recommendations.	Purchasing/contract approval belongs to the authorized function.
Site intervention	Investigates and corrects work within delegated competence.	Safety, live work and critical changes follow permit/approval rules.

8. Candidate Profile and Selection Criteria

8.1 Shared Core Expectations

- Relevant engineering qualification; able to explain a personally delivered piece of work, engineering choices and real validation results in the selected discipline.
- Able to read applicable drawings, controller programs, datasheets and fault logs and respect equipment/safety limits.
- Clear cross-functional communication, disciplined revision tracking and practical ownership through tests and site support.

8.2 Advantageous Experience

- Demonstrated capability across more than one track; relevant experience in FANUC, TIA Portal, WinCC, EPLAN or equivalent tools.
- Robot vision and palletizing, servo tuning, industrial networking, SCADA/logging and special-machine FAT/SAT exposure.
- Practical technical English, customer-site communication, mentoring and R&D-funded project reporting.

No fixed number of robotic cells, drawings or HMI projects is an across-the-board threshold. Practical capability, engineering rigor and evidence of delivery are more informative.

9. Tools, Systems and Example Projects

Domain	Typical environment
Robotics	Industrial robot controllers, offline simulation, machine vision, grippers, palletizing and field I/O.
PLC / HMI	IEC 61131-3 environments, network diagnostics, servo/motion, HMI/SCADA, oscilloscopes, traces and logs.
Electrical	Electrical CAD, protection/drive datasheets, cabinet layout, cable/terminal schedules and BOMs.
Shared	Task/change tracking, test checklists, backups/versions, mechanical/manufacturing teams and customer sites.

10. How Success Will Be Measured

Dimension	Expected result
Function / safety	Acceptance criteria are achieved and hazardous uncertainties are closed.
Maintainability / quality	Code and drawings are clear, tested, backed up, versioned and serviceable.
Schedule / cost	Risks are raised early and engineering alternatives are justified technically.

11. First 90 Days — Expected Ramp-Up

Period	Focus	Expected progress
First 30 days	Understand active projects, safety, tools and documentation workflow.	Complete and test a defined small engineering task with review.
Days 31–60	Own a defined subsystem and its cross-team interfaces.	Deliver code/drawings, test and documentation more independently.
Days 61–90	Manage technical risk, revisions and acceptance-readiness.	Own a defined scope with justified decisions and traceable test evidence.

12. Items to Confirm Before Offer

Confirm primary discipline, initial project, reporting line, approval authority, office/workshop/site split, expected travel, compensation/benefits, overtime policy and development opportunities in writing.