Preventive Maintenance Checklist for Allen-Bradley Systems

This list collects what to check and record during preventive maintenance of Allen-Bradley systems: controllers and I/O, power supplies and UPS, control panels, PowerFlex drives, EtherNet/IP networks, HMI/SCADA computers, program backups and OT security. Each item names the Rockwell Automation document and page to check against. The plant sets its own inspection intervals from the manufacturer documents and its own operating history; intervals are given only where the source document states one, and exactly as stated there.

Controllers and I/O

- [ ] Open Controller Properties in Studio 5000 Logix Designer and record the type/code shown on the Major Faults and Minor Faults tabs before clearing any fault. Ref.: 1756-PM014 p. 22, 25
- [ ] Check the I/O Configuration tree: for any module showing a warning symbol, open Module Properties and record the module state, fault description and major/minor faults. Ref.: 1756-UM543 p. 190
- [ ] Check and record the FORCE indicator: off = no I/O forces; steady yellow = I/O forces enabled and active; flashing yellow = force values exist in the application but are not enabled. Record any forced tags. Ref.: 1756-UM543 p. 209
- [ ] Record the controller firmware revision and the Studio 5000 Logix Designer version in use (they must share the same major revision, e.g. firmware 38.xxx with Logix Designer v38). Use the Product Compatibility and Download Center (PCDC) to check software compatibility and whether later firmware revisions, with release notes, are available. Ref.: 1756-UM543 p. 34–35
- [ ] ControlLogix 5570 (1756-L7x): read the controller status display and record any ESM message (ESM Not Present, ESM Incompatible, ESM Hardware Failure, ESM Energy Low); act as the manual states for that message, e.g. replace the ESM. Ref.: 1756-UM001 p. 175
- [ ] ControlLogix 1756-L6x with battery: check the BAT indicator and minor fault type 10, code 10; measure and record the temperature 2.54 cm (1 in.) below the chassis. Even if the BAT indicator is off, the manual says to replace the battery on this schedule: −25...35 °C no replacement required; 36...40 °C within 3 years; 41...45 °C 2 years; 46...50 °C 16 months; 51...55 °C 11 months; 56...70 °C 8 months. Ref.: 1756-UM001 p. 74

Power supplies and UPS

- [ ] ControlLogix chassis power supply: check that the green status indicator is on. If it goes off during operation, verify the line voltage is within the specified range, then follow the steps in the installation instructions. Ref.: 1756-IN619 p. 6
- [ ] ControlLogix redundant power supplies (1756-PA75R, 1756-PB75R...): record the Power (green) and Non-red (yellow) indicators on each supply. Normal: steady green, Non-red off; steady yellow Non-red means this supply is the only one powering the chassis adapter, so check the other supply. The chassis adapter indicator must be steady green. Ref.: 1756-IN620 p. 9
- [ ] Check that the redundant supplies' solid-state relay is wired to an input so the program alerts when a supply fails or is turned off (contacts closed in normal operation, open on these events). Ref.: 1756-IN620 p. 8
- [ ] Bulletin 1606 supplies with DC-OK (e.g. 1606-XLE480EP): check that the DC-OK LED is on (on when the output is above 90% of the adjusted voltage), measure and record the output voltage (factory setting for this model: 24.1 V), and check that the DC-OK relay contact is monitored. Ref.: 1606-RM001 p. 7, 11
- [ ] Check that the program reads bit 10 of MinorFaultBits (GSV of the FaultLog object): depending on the controller, it indicates a low battery, or an ESM or UPS that needs replacing or is missing. Record the bit state. Ref.: 1756-PM014 p. 23–24
- [ ] Bulletin 1609 UPS (e.g. 1609-S350): the UPS self-tests at turn-on and every two weeks by default; record the self-test result and the state of the Replace Battery/Battery Disconnected LED. Ref.: 1609-UM006 p. 6–7
- [ ] Bulletin 1609 UPS (e.g. 1609-S350): record the date of the last battery replacement and reset the Date of Last Battery Replacement setting whenever the battery is replaced; the manual calls for battery replacement every 2–4 years. Ref.: 1609-UM006 p. 8, 10

Control panels

- [ ] Record the panel inspection date. DRIVES-TD001 recommends an initial inspection within 3...4 months after installation, then an annual inspection; intervals are based on environmental/operating conditions and adjusted by experience. Ref.: DRIVES-TD001 p. 1
- [ ] Check for dust, dirt, moisture or other contamination inside the panel; if found, find and eliminate the cause (unsuitable enclosure, unsealed openings such as conduit, incorrect operating procedures). Clean by vacuuming or wiping; do not use compressed air to clear dust. Ref.: DRIVES-TD001 p. 2
- [ ] Inspect cooling fans and blowers: replace any with bent, chipped or missing blades or a shaft that does not turn freely; apply power momentarily to check operation; clean or change air filters as recommended. Ref.: DRIVES-TD001 p. 2
- [ ] Measure and record the ambient (inlet) air temperature at the ControlLogix chassis and compare it with the limits in 1756-TD001; check the clearances around the chassis. Within those limits and clearances the controller should not reach its initial thermal warning (minor fault). Ref.: 1756-UM543 p. 212
- [ ] Check the tightness of all terminals and bus bar connections and tighten any loose ones; replace parts or wiring damaged by overheating; check ground connection integrity. Ref.: DRIVES-TD001 p. 4
- [ ] Check that each chassis has an equipment-grounding conductor to its own bolt on the ground bus, and that the enclosure door has a bonding wire — the hinge must not be relied on for electrical contact. Ref.: 1770-4.1 p. 6–7
- [ ] Check contactor/relay contacts for excessive wear and dirt (discoloration and slight pitting are acceptable). Do not file contacts or use contact spray cleaners; do not lubricate Allen-Bradley starters, contactors and relays. Ref.: DRIVES-TD001 p. 4
- [ ] Visually inspect printed circuit boards: properly seated in their edge connectors with locking tabs in place; do not use solvents on boards. Ref.: DRIVES-TD001 p. 5

PowerFlex drives

- [ ] PowerFlex 520-series: record the fault queue b007…b009 [Fault 1…3 Code] and F604…F610 [Fault 4…10 Code] (b007 is the most recent; repeated faults are recorded once), plus b027 [Drive Temp] (heatsink temperature) and b005 [DC Bus Voltage]. Ref.: 520-UM001 p. 78–79, 83, 144
- [ ] PowerFlex 750-Series: record the STS indicator, P951 [Last Fault Code], P959/P960 [Alarm Status A/B], P943 [Drive Temp Pct], P944 [Drive Temp C] and P11 [DC Bus Volts]; correct the cause before clearing the fault. Ref.: 750-PM001 p. 24, 164, 311–312
- [ ] Before servicing the power section: after removing power, verify the DC bus capacitors have discharged — frames 1…7: measure +DC to −DC and each terminal to chassis, all three must read zero; frames 8…10: measure at the DC+ and DC− test points. Ref.: 750-PM001 p. 11
- [ ] PowerFlex 750-Series, 70, 700, 700S, DC (DRIVES-TD001 Table 1): main heatsink and door-mounted cooling fans are inspected yearly and replaced in years 5, 10, 15 and 20; door- and roof-mounted air filters are cleaned or replaced yearly, and the footnote says to inspect and replace filters every 3 months or more often depending on the environment. Record the dates. Ref.: DRIVES-TD001 p. 2
- [ ] PowerFlex 4-Series and 520-series: the recommended cooling device replacement interval is 3 years from startup, shorter in harsh ambient conditions. Record the startup date and fan replacement dates. Ref.: DRIVES-TD001 p. 3
- [ ] PowerFlex 753/755: read and record P469 [PredMaint Sts], P491 [HSFan RemainLife] and P498 [InFan RemainLife] (hours left to estimated end of life; negative values are treated as excessive use). Ref.: 750-PM001 p. 106, 108–109
- [ ] PowerFlex 750-Series: check that airflow clearances around the drive are unobstructed, inlet air temperature does not exceed the product specification, and the cooling fan is protected from dust and metallic particles; for floor-mount drives (frames 8…10), check that the filter and debris screens are installed. Ref.: 750-IN001 p. 36–37
- [ ] Spare drives in storage: record the storage duration. Under 2 years: no capacitor reforming required; 2…3 years: apply rated voltage for 30 minutes under no load; over 3 years: use a DC supply on the DC terminals and ramp the DC bus voltage in steps of 50%, 75% and 100%, 30 minutes each under no load. Ref.: DRIVES-TD001 p. 3

EtherNet/IP and Stratix networks

- [ ] Open the EtherNet/IP module's diagnostic webpages (e.g. 1756-EN2TR) and record CPU utilization; the conservative recommendation is not to exceed 80%, leaving capacity for web browsers and program downloads. Ref.: ENET-AT003 p. 17, 21
- [ ] Record the Interface Counters (in and out). If there are errors, check for a duplex mismatch or induced noise (use ping -t to the module to look for lost packets). Ref.: ENET-AT003 p. 21–22
- [ ] Record the CIP connections and TCP connections in use against the device's capacity; the recommendation is not to exceed 80%. Ref.: ENET-AT003 p. 23–24
- [ ] DLR networks: check ring status at the ring supervisor — Module Properties > Network tab in Logix Designer, the Diagnostics > Ring Statistics webpage, or Stratix Device Manager (Monitor > DLR, Overview, Faults and Members tabs). Record ring faults and the Last Active Node on port 1/port 2. Ref.: ENET-AT007 p. 89–91, 95
- [ ] Stratix switches (5400/5410/5700/8000/8300): in Device Manager open Port Status and record Port Alarm Status, Link Status, Port Fault Status and Threshold Exceeded for each port. Ref.: 1783-UM007 p. 299
- [ ] Open Monitor > Port Statistics and record error packets sent/received per port. Many alignment, FCS or late-collision errors indicate a speed or duplex mismatch; also check the cable distance to the connected device. Ref.: 1783-UM007 p. 302, 337
- [ ] Stratix with SD card: in Device Manager (Admin > Sync, Manual Sync tab) record SD Card Status (whether the switch started from the SD card or internal memory) and Sync Status; check that the card's read-only lock is not engaged, since changes are then not saved. Ref.: 1783-UM007 p. 58–59

HMI/SCADA PCs and servers

- [ ] Check the status of security updates (patches) for the operating system and IACS software. For Microsoft updates: check Rockwell's Microsoft Patch Qualification results, verify on a non-production system or while the facility is non-active before installing, and confirm configuration settings afterwards. Ref.: SECURE-RM001 p. 35
- [ ] Check that endpoint protection (antivirus/anti-malware) is installed and its definition files are up to date. Ref.: SECURE-RM001 p. 41
- [ ] Review and record the accounts with administrative rights on each computer; keep the number of such users to a minimum. Ref.: SECURE-RM001 p. 41
- [ ] Check that backups of important data and systems exist and that the backup and restore process has been validated. Ref.: SECURE-RM001 p. 41
- [ ] Check that USB, CD and DVD drives are available only for authorized purposes. Ref.: SECURE-RM001 p. 41
- [ ] Check that workstations are restarted regularly (to guard against memory-only infections). Ref.: SECURE-RM001 p. 41
- [ ] Record the FactoryTalk Services Platform version on each host; where possible keep the same version and patch level on all hosts, with the FactoryTalk Directory server at the highest version installed. Ref.: SECURE-RM001 p. 48
- [ ] Examine logs from workstations, firewalls, switches and devices for evidence of foreign activity. Ref.: SECURE-RM001 p. 55

Program backups and documentation

- [ ] Update the control system asset inventory: at minimum, all hardware and software products in use. Ref.: SECURE-RM001 p. 12
- [ ] Keep versioned backups of controller programs and compare them with the program running in the controller. FactoryTalk AssetCentre is one option: central version management, automated backups and difference-detection reports; a Disaster Recovery schedule backs up and compares the programs running in ControlLogix controllers and writes the results to the Event Log. Ref.: SECURE-RM001 p. 57
- [ ] If FactoryTalk AssetCentre is used: review the audit trail and check that the log is large enough to record all events and is not overflowing. Ref.: SECURE-RM001 p. 55–56
- [ ] Record the Change Detection audit value (Controller Properties > Security tab) and compare it with the previous record; if it differs, find out which change occurred. Ref.: 1756-UM543 p. 159
- [ ] Check that the memory card is still installed in the controller (so diagnostic data is written if a fault occurs). If the card is used to load the project, confirm the project stored on it matches the current project, since changes made after the last Store are not on the card. Ref.: 1756-UM543 p. 76
- [ ] Keep a complete record of drive parameter settings close to the drive, and keep good maintenance records. Ref.: DRIVES-TD001 p. 5
- [ ] Record the lifecycle status of each product (Active, Active Mature, End of Life, Discontinued) and the state of each software/firmware version (Preferred, Managed, Limited, Retired) from the Product Lifecycle Status website and the PCDC. Ref.: SECURE-RM001 p. 39–40

OT security basics

- [ ] Check that the controller keyswitch is in RUN with the key removed during runtime; use REM or PROG only during commissioning, maintenance or when program, configuration or firmware changes are needed. Ref.: 1756-UM543 p. 70
- [ ] Check that control cabinets are locked, tamper-evident seals are intact and the seal logbook is maintained; inspect physical security measures for damage or signs of tampering. Ref.: SECURE-RM001 p. 42–43
- [ ] Review user accounts against least-privilege access; manage users centrally (FactoryTalk Security or Microsoft Active Directory) rather than with local passwords, so access can be changed when staff leave or change roles. Ref.: SECURE-RM001 p. 47
- [ ] Remote access with Stratix 4300 and FactoryTalk Remote Access: check that two-factor authentication is enforced, the software is up to date, the physical controls are used to enable or disable remote access, incident logs are reviewed, and the remote access solution is reviewed regularly. Ref.: SECURE-RM001 p. 32
- [ ] Wireless access points: check that WPA2 or WPA3 is used, default credentials have been changed, passwords are strong (12 or more characters mixing letters, numbers and special characters is recommended) and the access point is in a secure location. Ref.: SECURE-RM001 p. 32
- [ ] Based on the system's risk assessment, check that unused controller functions are disabled — for example on CompactLogix 5380: Ethernet port, USB port, SD card, controller webpages. Ref.: 5069-UM001 p. 186–187
- [ ] Check that the Rockwell Automation Security Advisory Index is subscribed to, and record advisories that affect devices in the asset inventory. Ref.: SECURE-RM001 p. 42

Always read the manual for the exact model before maintenance. Servicing energized equipment can be hazardous: disconnect and lock out power and discharge stored energy in capacitors; only qualified personnel may work near energized equipment. TDL's yearly maintenance contracts cover checks such as these.

Sources

- Rockwell Automation, 1756-UM543, *ControlLogix 5580 and GuardLogix 5580 Controllers User Manual (1756-UM543T-EN-P)*, December 2025
- Rockwell Automation, 1756-UM001, *ControlLogix 5570 and 5560 Controllers User Manual (1756-UM001Q-EN-P)*, December 2024
- Rockwell Automation, 1756-PM014, *Logix 5000 Controllers Major, Minor, and I/O Faults Programming Manual (1756-PM014O-EN-P)*, September 2024

- Rockwell Automation, 5069-UM001, *CompactLogix 5380 and Compact GuardLogix 5380 Controllers User Manual (5069-UM001N-EN-P)*, January 2026
- Rockwell Automation, 1756-IN619, *ControlLogix Power Supply Installation Instructions (1756-IN619G-EN-P)*, July 2023
- Rockwell Automation, 1756-IN620, *ControlLogix Redundant Power Supply Installation Instructions (1756-IN620F-EN-P)*, July 2023
- Rockwell Automation, 1606-RM001, *Bulletin 1606 Switched Mode Power Supplies Reference Manual, 1606-XLE480EP (1606-RM001B-EN-P)*, August 2013
- Rockwell Automation, 1609-UM006, *User Manual for 350 VA Industrial UPS, 1609-S350NS/1609-S350ES*, May 2006
- Rockwell Automation, 1770-4.1, *Industrial Automation Wiring and Grounding Guidelines (publication 1770-4.1)*, February 1998
- Rockwell Automation, DRIVES-TD001, *Preventive Maintenance Checklist of Industrial Control and Drive System Equipment (DRIVES-TD001C-EN-P)*, May 2019
- Rockwell Automation, 750-IN001, *PowerFlex 750-Series AC Drives Installation Instructions (750-IN001T-EN-P)*, March 2026
- Rockwell Automation, 750-PM001, *PowerFlex 750-Series AC Drives Programming Manual (750-PM001Q-EN-P)*, November 2024
- Rockwell Automation, 520-UM001, *PowerFlex 520-Series Adjustable Frequency AC Drive User Manual (520-UM001O-EN-E)*, September 2025
- Rockwell Automation, ENET-AT003, *Troubleshoot EtherNet/IP Networks Application Technique (ENET-AT003B-EN-P)*, June 2014
- Rockwell Automation, ENET-AT007, *EtherNet/IP Device Level Ring Application Technique (ENET-AT007E-EN-P)*, June 2023
- Rockwell Automation, 1783-UM007, *Stratix Managed Switches User Manual (1783-UM007Q-EN-P)*, July 2022
- Rockwell Automation, SECURE-RM001, *System Security Design Guidelines Reference Manual (SECURE-RM001J-EN-P)*, November 2025