



# Training Catalogue

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Electronic Industries

## Flying Probe and 3030 testers

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# Training products for Electronic Industries

Type	Machine	Characteristics	Self learn
E-learning	3030 Flying Probe s2	In-home training Unlimited users and execution Single company Self planning Remote support pack	100% Customer
Classroom multi company 1.0	3030 Flying Probe s2	Spea site Up to 5 participants Multi company Yearly planning	10% Customer
Private lesson	Bed of nails all models Flying Probe all models	On-site or Spea site Unlimited participants Single company Custom planning Custom duration	10% Customer

# Training Orientation

For ...	Who	Requirement
BEGINEER	Programming engineer	<ul style="list-style-type: none"> <li>- Passive/discrete components functioning.</li> <li>- Electrical quantities (P, V, I, R, L, C)</li> </ul>
	Production operator	<ul style="list-style-type: none"> <li>- Passive/discrete components functioning.</li> <li>- Electrical quantities (P, V, I, R, L, C)</li> </ul>
	Service engineer	<ul style="list-style-type: none"> <li>- None.</li> </ul>
INTERMEDIATE	Programming engineer	<ul style="list-style-type: none"> <li>- Passive/discrete components functioning.</li> <li>- Electrical quantities (P, V, I, R, L, C)</li> <li>- Analog/Digital/Op-Amp components functioning.</li> <li>- Datasheets understanding.</li> <li>- Experienced Test Engineer (at least 10-15 Ict test programs developed).</li> </ul>
	Service engineer	<ul style="list-style-type: none"> <li>- Production operations skills acquired from training (BON-USE-201B or FP-USE-201B) or equivalent knowledge of the main parts of the system and production control panel uses.</li> </ul>
EXPERT	Programming engineer	<ul style="list-style-type: none"> <li>- Passive/discrete components functioning.</li> <li>- Electrical quantities (P, V, I, R, L, C)</li> <li>- Analog/Digital/Op-Amp components functioning.</li> <li>- Datasheets understanding.</li> <li>- Experienced Test Engineer (at least 15-20 Ict test programs developed)</li> <li>- Principles of programming language (Visual Basic).</li> <li>- Ict test full knowledge.</li> <li>- Fixture/cable design knowledge.</li> <li>- Functional test knowledge.</li> </ul>

# E-Learning Training

Profile	Name	Oriented for ...	Skills	Details
Production operations	<b>E-LEARNING TRAINING FOR QSOFT</b>	<b>BEGINNER</b>	FP-BON-USE-202B - QSoft	Lesson type: E-Learning. Where: <a href="http://elearning.spea.com">http://elearning.spea.com</a> Type: included with any Qsoft Suite.

# Flying Probe Training for Beginner-Intermediate-Expert

Profile	Name	Purpose	For ...	Skills	Details
Programming engineer	<b>TRAINING FOR FLYING PROBE TEST ENGINEER</b>	Course oriented to the Test Engineer that needs to create an Ict-Off test program starting from input files (CAD, BOM and Schematics) ready to use for production purpose.	<b>BEGINNER</b>	FP-PROG-001B - Ict-Off test program. FP-USE-201B - Productions operations. Exercise on customer product.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 5 days.
Programming engineer	<b>TRAINING FOR FLYING PROBE REVERSE ENGINEERING</b>	Course oriented to the Test Engineer that needs to create a test program without input files starting from golden board only.	<b>INTERMEDIATE</b>	FP-PROG-004B - Leonardo Board Learn. FP-PROG-006B - Leonardo Cad Builder. FP-PROG-009B - Leonardo board data re-built.	Lesson type: Private. Location: SPEA, On-Site. Duration: 2 days.
Programming engineer	<b>TRAINING FOR FLYING PROBE TEST ENGINEER UPDATE TO LEONARDO OS</b>	Course oriented to the skilled Test Engineer to update own knowledges about Ict-Off test program creation on new development platform starting from input files (CAD, BOM and Schematics).	<b>INTERMEDIATE</b>	FP-PROG-001B - Ict-Off test program. FP-USE-201B - Productions operations. FP-PROG-014B - Test program migration	Lesson type: Private. Location: SPEA, On-Site. Duration: 3 days.
Programming engineer	<b>TRAINING FOR FLYING PROBE TEST ENGINEER POWER-ON PROGRAMMING (A)</b>	Course oriented to the skilled Test Engineer to update own knowledges about Ict-On test program creation starting from input files (CAD, BOM and Schematics).	<b>EXPERT</b>	FP-PROG-011B - Ict-On from probes without adapter. FP-PROG-012B - Ict-On from probes with adapter. FP-PROG-002B - Smart Obp.	Lesson type: Private. Location: SPEA, On-Site. Duration: 4 days.
Production operator	<b>TRAINING FOR FLYING PROBE PRODUCTION OPERATOR</b>	Course oriented to the Production Operator that needs to use and maintenance the test program already developed for boards testing on manufacturing department.	<b>BEGINNER</b>	FP-USE-201B - Productions operations.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 2 days.
Service engineer	<b>TRAINING FOR FLYING PROBE MAINTENANCE ENGINEER</b>	Course oriented to the Service Engineer that needs to perform preventive/corrective maintenance, diagnostic and parts identification and replacement of the ATE.	<b>INTERMEDIATE</b>	FP-SERV-101B - Electrical maintenance and diagnostic operations.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 2 days.
Service engineer	<b>TRAINING FOR FLYING PROBE CALIBRATION ENGINEER (B)</b>	Course oriented to the Service Engineer that needs to perform electrical calibration/ adjustment of Ict instruments. He will also able to certify by own the calibration results.	<b>INTERMEDIATE</b>	FP-SERV-102B - Calibration.	Lesson type: Private. Location: SPEA, On-Site. Duration: 1 day.
Programming engineer Production operator Service engineer	<b>CUSTOM</b>	Customizable	<b>BEGINNER</b> <b>INTERMEDIATE</b> <b>EXPERT</b>	Customized.	Lesson type: Private. Location: SPEA, On-Site. Duration: CUSTOM.

(A) For On-Site training SPEA reserves the confirmation of the training consequently to the technical feasibility.

(B) The course is closely related to specific tools kit which is sold separately.

# All Flying Probe Skills

## Beginner

PROGRAMMING – PRODUCTION OPERATIONS – SERVICE

### FP-PROG-001B - Ict-Off test program

- LEONARDO Express test program generation and debug starting from input files (CAD, BOM and Diagrams).
- Test program coverage result: Ict-Off, Optical, Led colour, Electro Scan, Junction Scan, Laser, Nzt.
- Test program options: add compositions, tools and certifications.

### FP-PROG-004B - Leonardo Board Learn

- LEONARDO Board Learn test program acquisition starting from images file and golden board.
- LEONARDO Board Learn test program acquisition starting from Pick&Place file and golden board.

### FP-PROG-005B - Leonardo Autoprogram

- LEONARDO Autoprogram test program generation and debug starting from input files (CAD and BOM).
- Test program coverage result: Ict-Off, Optical Test.
- Test program options: compositions, tools and certifications.

### FP-PROG-007B - Leonardo Pcb

- LEONARDO Pcb test program generation and debug starting from input files (CAD only).
- How to read Test program coverage: short, continuity and insulation for bare board testing.
- Test program options: tools and certifications.

### FP-PROG-008B - Leonardo Board Repair

- LEONARDO Board Repair test program generation for repairing starting from Golden Board.
- How to use the automatic function for self-learning components and nets impedance.
- How to use tools for net list acquisition and schematics generation.
- How to increase test program Coverage with: mosfet, transistor, relay, sink test, dual sink test, nodal voltage test, custom parameters (accordingly to the board under test).
- How to create custom test list.
- How to use repairing tools on repair environment.

### FP-SERV-103B - System installation

- Flying Probe movement and handling for positioning.
- Common operations for Flying Probes installation and startup like: system parts check, power supply check and connections, positioning, levelling, switch on, diagnostic operations and basic maintenance.

### FP-USE-201B - Productions operations

- Test program use, startup and stabilization on production environment.
- Understand ATE faults and troubleshooting (use of system tools for repair the UUT).
- Test program settings (serial number, certification data collection, ...)
- Testing area operations: board contrast handling, removable shuttle handling, load equipments (cable or fixture), probes changes.
- Fiducials management.
- Use of Test program release.
- Test program maintenance (debug techniques) for small changes as: guard, test points, test time, ...
- System diagnostic execution.
- Mechanical tools alignment (probes, electro scan, multi probe, fingers, BTU).

### FP-BON-USE-202B - QSoft

- Configure the test program using QSoft.
- Use of the packages suite as: test data repair, statistics and certifications, option and customizations.

### FP-BON-USE-203B - Automation

- How to set up the test program in order to use Test Cell Automation, such as: Loader, Unloader, Flip Over Mechanism.

## Intermediate

PROGRAMMING – SERVICE

### FP-PROG-002B - Smart Obp

- How to configure the parameters for component programming using the SMART OBP environment.

### FP-PROG-006B - Leonardo Cad Builder

- LEONARDO Cad Builder used for golden board reverse engineering acquisition to obtain input files as: CAD (Flat format), BOM and Diagrams.

### FP-PROG-009B - Leonardo board data re-build

- LEONARDO Board Data re-built starting from: sample board, diagrams, BOM and Gerber files.
- LEONARDO Board Data re-built starting from: sample board, diagrams, BOM and images.

### FP-PROG-010B - Test program conversion

- Use of Takaya migration pack.
- Convert the test program among different SPEA's test platform.

### FP-PROG-011B - Ict-On from probes without adapter

- LEONARDO Express test program generation and debug starting from input files (CAD, BOM and Diagrams) review.
- Highlights Ict-Off test on: transformers, triac, scr, tranzorb, cluster (series of 2 or more components).
- Highlights Ict-On from probes as: frequency measure, sink test on single and dual power, nodal voltage test, voltage regulators, how to use the generators as load.
- Use the functions as: import and insert from.

### FP-PROG-014B - Test program migration

- How to migrate the test program from old ATE to the new ATE («ATOS to Leonardo OS» or «Leonardo OS Old to Leonardo OS New»).

### FP-SERV-101B - Electrical maintenance and diagnostic operations

- System architecture overview (block diagram and board identification).
- Yearly electrical maintenance and diagnostic operations
- Diagnostic report check and interpretation.
- Interpretation of the system sensors via the Service Automation Console and I/O Monitor.
- Use of the Service interval.
- Mechanical tools alignment (probes, electro scan, multi probe, fingers, BTU).
- Repair: rack card identification and replacement, fuses and relays replacement, Axis card replacement (no electrical calibration), Z axis cable replacement, fault simulation and practical exercises.
- How to use CSA area (RAN, SPR, APR, HPR) and SPEA eShop.

### FP-SERV-102B - Calibration

- YAICT, YASAU, YAGEN, YAPROCO and ZPROMEA calibration and adjustment operations.
- How to use the calibration and adjustment tools: Z037100, Multimeter and Counter.
- How to fill and read the calibration report for auto-certification.

## Expert

PROGRAMMING

### FP-PROG-013B - Libraries

- Create and use a new Component Data.
- Create a new library and a new custom test model starting from an existing one.
- Use custom libraries during test program generation.
- Copy a test already debugged in the library to use it for future test program generation.

### FP-PROG-003B - Tools integration on test program

- Bottom Multiprobe Unit (BMU) programming and use on existing Leonardo test program. Case studied: BMU for power-on test, BMU for Gopel boundary scan integration.
- Xjtag application integration on existing Leonardo test program (no Xjtag application programming is included).

### FP-PROG-012B - Ict-On From probes with adapter (cable/fixture/fixed probe)

- LEONARDO Express/Advanced test program generation and debug starting from input files (CAD, BOM and Diagrams).
- How to design the equipment for powering-up the unit under test (block diagram and wiring diagram). Case study: cable/fixture/fixed probe.
- How to structure the Ict-On test program.
- Use of SPEA's libraries to find alias components.
- Generate and debug powered tests for analog/digital and operational amplifier components.

**NOTICE: all skills are closely related to the customer system/software configuration.**

# 3030 Training for Beginner-Intermediate-Expert

Profile	Name	Purpose	For ..	Skills	Details
Programming engineer	<b>TRAINING FOR 3030 TEST ENGINEER (A)</b>	Course oriented to the Test Engineer that needs to create an Ict-Off test program starting from input files (CAD, BOM and Schematics) ready to use for production purpose.	<b>BEGINNER</b>	BON-PROG-001B - Ict test program. BON-PROG-018B - Fixture design. BON-PROG-201B - Productions operations.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 5 days.
Programming engineer	<b>TRAINING FOR 3030 FUNCTIONAL TEST ENGINEER (A)</b>	Course oriented to the skilled Test Engineer that needs to create a functional test program starting from board specifications and through programming language (.NET).	<b>EXPERT</b>	BON-PROG-018B - Fixture design BON-PROG-014B - Functional test program. BON-PROG-015B - VRAD test program	Lesson type: Private. Location: SPEA, On-Site. Duration: 4dd.
Production operator	<b>TRAINING FOR 3030 PRODUCTION OPERATOR (A)</b>	Course oriented to the Production Operator that needs to use and maintenance the test program already developed for boards testing on manufacturing department.	<b>BEGINNER</b>	BON-USE-201B - Productions operations.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 2 days.
Service engineer	<b>TRAINING FOR 3030 MAINTENANCE ENGINEER</b>	Course oriented to the Service Engineer that needs to perform preventive/corrective maintenance, diagnostic and parts identification and replacement of the ATE.	<b>INTERMEDIATE</b>	BON-SERV-101B - Electrical maintenance and diagnostic operations.	Lesson type: Private, Classroom. Location: SPEA, On-Site. Duration: 2 days.
Service engineer	<b>TRAINING FOR 3030 CALIBRATION ENGINEER (B)</b>	Course oriented to the Service Engineer that needs to perform electrical calibration/ adjustment of Ict instruments. He will also be able to certify by own the calibration results.	<b>INTERMEDIATE</b>	BON-SERV-102B - Calibration.	Lesson type: Private. Location: SPEA, On-Site. Duration: 1 day.
Service engineer	<b>TRAINING FOR 3030-IL MECHANICAL ENGINEER (B)</b>	Course oriented to the Service Engineer that needs to perform preventive and corrective maintenance operations on 3030-IL receiver.	<b>INTERMEDIATE</b>	BON-SERV-104B - Mechanical maintenance operations (3030-IL only)	Lesson type: Private. Location: SPEA, On-Site. Duration: 2 days.
Programming engineer Production operator Service engineer	<b>CUSTOM</b>	Customizable	<b>BEGINNER</b> <b>INTERMEDIATE</b> <b>EXPERT</b>	Customized.	Lesson type: Private. Location: SPEA, On-Site. Duration: CUSTOM.

(A) For On-Site training the customer equipment is required. The SPEA reserves the confirmation of the training consequently to the technical feasibility.  
 (B) The course is closely related to specific tools kit which is sold separately.

# All 3030 Skills

## Beginner

PROGRAMMING – PRODUCTION OPERATIONS – SERVICE

### BON-PROG-001B Ict test program

- LEONARDO Express test program generation and debug starting from input files (CAD, BOM and Diagrams).
- Test program coverage result: Ict-Off, Ict-On, Junction Scan and Electro Scan.
- Test program options: compositions (variant), tools and certifications.

### BON-PROG-009B - Leonardo board data re-build

- LEONARDO Board Data re-build starting from: sample board, diagrams, BOM and Gerber files.
- LEONARDO Board Data re-build starting from: sample board, diagrams, BOM and images.

### BON-PROG-010B - Test program conversion

- Convert the test program among different SPEA ATE.

### BON-PROG-018B - Fixture design

- Electrical desing of the fixture for SPEA ATE.
- Block diagram.
- Schematics or wiring list.
- Test point plot.
- Layout definition.
- Part list definition.

### BON-SERV-103B - System installation

- 3030 movement and handling for positioning.
- Common operations for 3030 installation and startup (system parts check, power supply check and connections, positioning, diagnostic operations).

### BON-USE-201B Productions operations

- Test program use, startup and stabilization on production environment.
- Understand ATE faults and troubleshooting (use of system tools for repair the UUT).
- Test program settings (serial number, certification data collection, ...)
- Testing area operations: board handling, fixture and pressor plate loading and handling, nails changes.
- Fixture maintenance operations: wiring repair, nails replacement, hardware fixture identification and replacement.
- Use of Test program release.
- Test program maintenance (debug techniques) for small changes as: guard, test points, test time, ...
- Test program options: compositions (variant), tools and certifications.
- System and fixture diagnostic execution.

### FP-BON-USE-202B - QSoft

- Configure the test program using QSoft.
- Use of the packages suite as: test data repair, statistics and certifications, option and customizations.

### FP-BON-USE-203B - Automation

- How to set up the test program in order to use Test Cell Automation, such as: Loader, Unloader, Flip Over Mechanism.

## Intermediate

PROGRAMMING – SERVICE

### BON-PROG-002B - SMART Obp

- How to configure the parameters for component programming using the SMART OBP environment.

### BON-PROG-013B - Libraries

- Create and use a new Component Data.
- Create a new library and a new custom test model starting from an existing one.
- Use custom libraries during test program generation.
- Copy a test already debugged in the library to use on next test programs generation.

### BON-SERV-101B - Electrical maintenance and diagnostic operations

- System architecture overview (block diagram and board identification).
- Yearly electrical maintenance and diagnostic operations.
- Diagnostic report check and interpretation.
- Interpretation of the system sensors via the Service Automation Console and I/O Monitor.
- Use of the Service interval.
- Repair: rack card identification and replacement, fuses and relays replacement, nails interface replacement, fault simulation and practical exercises .
- How to use CSA area (RAN, SPR, APR, HPR) and SPEA eShop.

### BON-SERV-102B - Calibration

- YASU, YAICT, YASAU, YAGEN, YAPSU, YAPMU calibration and adjustment of the system (accordingly to the hardware configuration of the system).
- How to use the calibration and adjustment tools: Z037100, Multimeter and Counter.
- How to fill and read the calibration report for auto-certification.

### BON-SERV-104B - Mechanical maintenance operations (3030-IL only)

- System overview
- Preventive Maintenance:
  - a) Receiver parts greasing
  - b) Board trasportation check
  - c) Test area planarity check
  - d) Pressor motor and belt check
  - e) Contrast spring replacement
- Corrective Maintenance:
  - a) Bell, motor and conveyor replacement
  - b) Board trasport unit paralellism adjustment
  - c) Test area planarity adjustment
  - d) Pressor motor and belt adjustment
  - e) Pressor mechanism and belt adjustment
  - f) Motor of the width adj replacement
  - g) Lock mechanism and/or motor replacement
- How to use CSA area (RAN, SPR, APR, HPR using) and SPEA Eshop.

## Expert

PROGRAMMING

### BON-PROG-014B - Functional test program

- HW/SW system architecture.
- Precautions and modes of use of a functional system (measure > 80V, GND connection, HV discharging capacitor, LV/HV channels uses).
- Functional test program design (specific analysis, check system resources, project block diagram, wiring diagram, fixture diagnostic, test program debug).
- Pre-screening test development: test point list, analog pre-screening (short, low-value resistors, links, ...), organizer instruction.
- Structuring the functional program using VRAD and write functions with LEONARDO F for: task for switch-on the board, tasks for voltage measuring, tasks for current measurements, task to perform time measurements.
- Test result management and datalog.
- Using the visual debugger.

### BON-PROG-015B - VRAD test program

- Library functions development based on SPEA functions (eg.: V meas, I meas, T meas) or customer functions (DLL or others).
- Subset definition.
- FCT test plan development: task and test creation, test parameters writing, library function association on test.
- «Parameter map» definition (project register) and source code generation.
- Execution rules definition and FCT test plan debug.
- Organizer testplan definition.
- Use the test program on production environment.

### BON-PROG-016B - Test pattern

- Create a pattern of a logic gate using VECTORVIEW and PAGEL C.
- Create a pattern of a Octal D-Type Flip Flop with VECTORVIEW.
- Create a pattern of a E2Prom through PAGEL C.
- Create a pattern for a Digital Potentiometer through PAGEL C.

### BON-PROG-017B - Functional Obp

- How to design an Obp application (component analysis, driver documentation analysis, check system resources, block diagram for power on, Obp channels identification, schematics design).
- Design precautions of the fixture finalized for Obp programming.
- How to create and debug the component power-on task.
- How to create and debug the Obp test plan starting from driver's model manual (stuck configuration, memory allocation cofiguration, FW configuration, component configuration).
- How to create and debug the Organizer test plan (Obp managment results, datalog, half run).

**NOTICE: all skills are closely related to the customer system/software configuration.**

# 2016 Classroom Multi Company Calendar

TRAINING FOR 3030 TEST ENGINEER	BEGINNER	3030	5 days	Start on Moday	Jan	Mar	May	Jul	Sep	Nov
TRAINING FOR FLYING PROBE TEST ENGINEER	BEGINNER	Flying Probe s2	5 days	Start on Moday	WK3	WK11	WK19	WK27	WK37	WK45
TRAINING FOR 3030 PRODUCTION OPERATOR	BEGINNER	3030	2 days	Start on Tuesday	Feb	Mar	May	Jul	Sep	Nov
TRAINING FOR FLYING PROBE PRODUCTION OPERATOR	BEGINNER	Flying Probe s2	2 days	Start on Tuesday	WK5	WK12	WK20	WK28	WK38	WK46
TRAINING FOR 3030 MAINTENANCE ENGINEER	INTERMEDIATE	3030	2 days	Start on Tuesday	Feb	Apr	Jul	Oct		
TRAINING FOR FLYING PROBE MAINTENANCE ENGINEER	INTERMEDIATE	Flying Probe s2	2 days	Start on Thursday	WK4	WK16	WK29	WK42		