



## Company Presentation and the Repair Center

- 
- Electronic Design
  - Electronic Maintenance
  - Repair Center & Commissioning



**GRUPPO FOS**

Communication  
Technology



## Repair Center

 **GRUPPO FOS**  
soluzioni ad alta tecnologia

 **T&G**



- **HISTORY:**

The Repair Center is located in San Marco Evangelista – Caserta (20 Km far from Naples Airport) site where repair takes place. Repair activities are in place since 2013.

- **DIMENSIONS:**

The Repair Center is large 1000 square meter, while the Office space is large 250 square meter.

- **REPAIR VOLUMES:**

The Repair Center is dimensioned to handle approximately 12.000 repairs per year, with peaks of 60 repairs in a single day; the whole repair activities are supported by integrated logistic services.



# Repair Center - Capabilities

The Repair Center repair capabilities are:

- **TELECOMMUNICATIONS:** **Core** network (fixed, mobile), **Transport** network (wireline and wireless, electrical and optical) and **Access** network (wireline and wireless).
  - **Core** network:
    - BSC
    - RNC
    - etc.
  - **Transport** network:
    - *Wireline*: SDH, WDM, GigaEthernet, etc.
    - *Wireless*: Microwave (e.g. ALU LSY 9600)
  - **Access** network:
    - *Wireline*: DSLAM, PDH Muxes, etc.
    - *Wireless*: Radio Base Station (e.g. Ericsson KDU)
  
- **NON-TELECOMMUNICATIONS:** **Power**, **IT** (Workstations), **Touch-devices**.

The Repair Center, in the **Biomedical** field, has enlarged its repair competences, from peripheral devices (such as workstations, printers, storages, etc) to parts constituting the core of the main diagnostic products (such as ultrasounds and CAT systems for instance).

In such a field, the Repair Center has competences and tools/instruments to repair, sanitize and recondition both electronic boards and mechanical parts constituting the core of the biomedical products, according to both functional and esthetic quality standards.

➔ **Know-how, processes and tools to test the repaired Spare Parts.**



The Repair Center is specialised in repairing the **100%** of «obsolete» or «out-of-production» **Spare Parts**, thanks its **Supply Chain capability** to make available all the necessary components; obviously, 100% repair of «obsolete» or «out-of-production» Spare Parts does not include Beyond Economical Repair items.

The company holds the ISO 9001 Certificate.

Supply of “Refurbished” equipment.

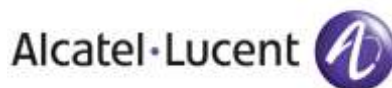


The Repair Center guarantees:

- Capability to cope with **volume increase and/or new technologies**.
- Capability to handle **technologies outside Telecommunication** arena.
- **Commissioning & De-commissioning** of complete equipment.
- **On-site intervention** of specialized engineers.
- 3D printer for plastic items
- 100% of safety procedures and tools.







# Repair Center - Services

- **Gruppo FOS (T&G)** provides Standard, Fast and Swap Repair services, by its Laboratory and the Swap Warehouse.
- **STANDARD REPAIR:** The average delivery time of the repairs takes place in a range of:
  - 20 calendar days for parts without BGA.
  - 25 - 30 calendar days for parts with BGA.
- **FAST REPAIR:** The average delivery time of the repairs takes place in a range of: 3 -10 calendar days
- **SWAP REPAIR:** The average delivery time of the repairs takes place in a range of 2 - 4 calendar days.
- **REVERSE ENGINEERING** of faulty spare parts (even in phase-out).



## Repair Services Supply Chain





SWAP &  
SPARE PARTS  
WAREHOUSE

- Alu 16xx and 1850 TSS
- Lucent 1675 & OLS
- Ericsson - Marconi

TOTAL OF  
SPARE PARTS

→ 2,500

The Company maintains a substantial inventory of spare parts to manage all repair business and ensure fast turnaround of boards.

# Repair Performance & Quality KPIs



On Time SLA: Average Items repaired on Time:  $\geq 98\%$

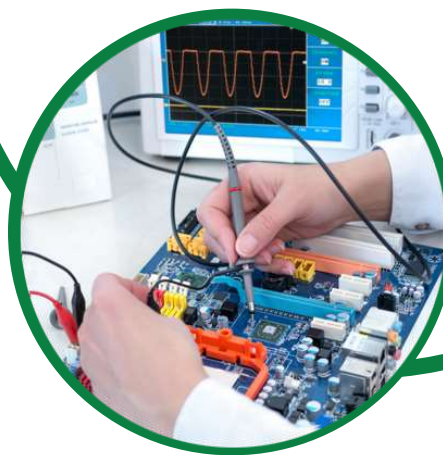


TAT (Turn Around Time):

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  - 20 calendar days for parts without BGA.
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- FAST REPAIR : The average delivery time of the repairs takes place in a range of: 3 -10 calendar days
- SWAP REPAIR: The average delivery time of the repairs takes place in a range of 2 - 4 calendar days.



Items not repaired in % on total items:  $\leq 3\%$



For each request of repair, **the Repair Center industrial process** imposes to record:

1. Customer, Purchase Order, Customer shipping document («DDT»), technology, faulty spare part receiving date, Customer site where the faulty spare part is arriving from, condition of receiving packaging;
2. Part Number, Serial Number, Customer RMA, T&G RMA, T&G RMA creation date;
3. Description of spare part fault and solution;
4. Shipping date of the repaired (or new) spare part, site where the repaired spare part has to be shipped to, courier, tracking number, T&G shipping document («DDT»).

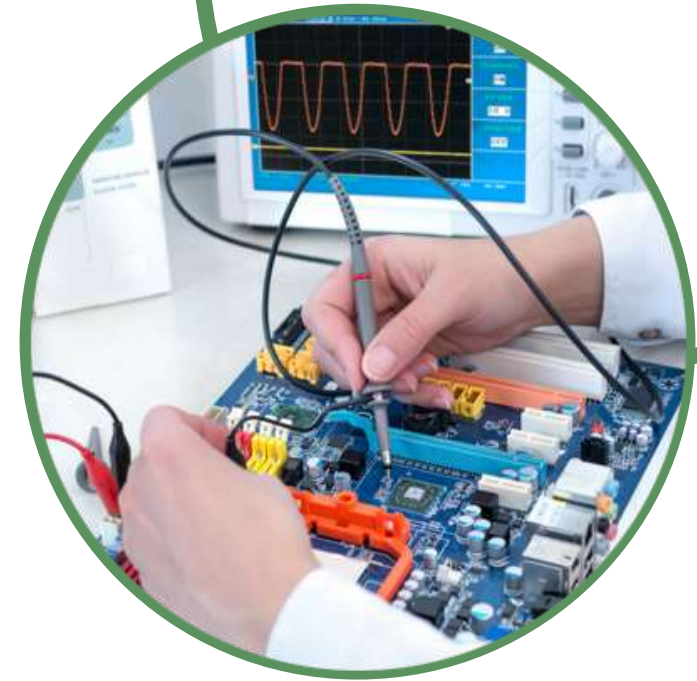


Such a structured approach guarantees the **traceability** in each part of the process.

# Electronic Equipment Platform Board<sup>++</sup>

The supply chain process is supported by an ad-hoc software platform able to handle all activities from material incoming to delivery.

This platform allows to monitor the processes and activities carried out by assuring the traceability of materials, measuring throughput time, generating Test Report, measuring service levels to provide our Customers with the required quality levels and compliance with delivery time



1. Test Bench Design



2. Purchasing Office



3. Assembly And Repair



4. SWAP And Fast Repair



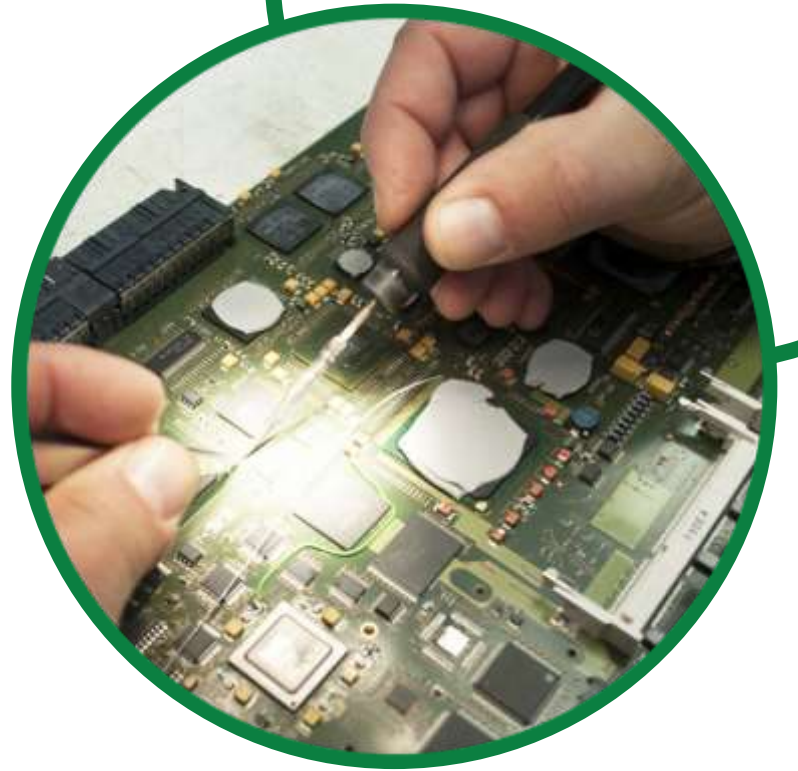
5. Monitoring of Restored Components



6. Packaging and Shipping

Our largest customer (Tier 1 Telecom Vendor) has certified that the Company is “**preferred supplier**” for the following services:

- Spare part Material Supply
- Spare part Repairing
- Spare part Transportation
- Spare part Warehousing



# Repair Center References – pag. 1 of 2

COUNTRY	VENDOR	TECHNOLOGY	SLA	PRODUCT
Italy	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair, Swap&Repair	ALU SDH 1641, 1651, 1661, 1650, 1660, 1662, 1670,1678. 1850 TSS 320, 160, 100, 40 , 5, 320H, 160H.
Italy	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair, Swap&Repair	ALU WDM 1686, 1626, 1696, 1830 PSS 32.
Italy	Ericsson-Marconi	Fixed Access (ULL, mux PDH)	Standard Repair, Swap&Repair	Marconi/Ericsson AXH & EDA (all families).
Italy	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair, Swap&Repair	Marconi/Ericsson MSH (all families), OMS (all families), SMA (all families).
Italy	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair, Swap&Repair	Marconi/Ericsson MHL3000.
Italy	Nokia	Fixed Access (ULL, mux PDH)	Standard Repair	Nokia Eksos e Dynanet.
Italy	Nokia	Core network (fixed, mobile, data)	Standard Repair	Nokia Flexi BSC & RNC 2600 .
Italy	SIEMENS-ITALTEL	Core network (fixed, mobile, data)	Standard Repair	Many models.
Italy	TELLABS	Core network (fixed, mobile, data)	Standard Repair	Many models.
Italy	ALU	Core network (fixed, mobile, data)	Standard Repair	S12.
Italy	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair, Swap&Repair	SDH 1664, WDM 1686WM-T, WDM 1696WM-O.
Italy	ALU	(Mobile Access (BTS, node B)	Standard Repair	BSC, COMBINER900, MFS-A9130.
Italy	ALU	Fixed Access (ULL, mux PDH)	Standard Repair, Swap&Repair	5450ISC/5420CTS, 8650SDM, ACME, ACME4500, ASAM, CONVEDIA, CROSS, ISAM, ISAM V, ISAM7360FX, LITESPAN ATM, LITESPAN IP, MGC8.
Italy	ALU	Core network (fixed, mobile, data)	Standard Repair, Swap&Repair	S12/IRSU.
Italy	Ericsson	(Mobile Access (BTS, node B)	Standard Repair	RBS2000.
Italy	Ericsson	Core network (fixed, mobile, data)	Standard Repair	APT, APZ, AXE, CGSN R4 (G) MKIV, IOG11, IOG20, MSC-S R13.2 (CN-S V6.1).
Italy	Nokia	(Mobile Access (BTS, node B)	Standard Repair	FLEXI2G, FLEXI3G.
Italy	SIEMENS-ITALTEL	(Mobile Access (BTS, node B)	Standard Repair	BS241, BS82, NodeB.
Italy	Nortel	Core network (fixed, mobile, data)	Swap&Repair	ATM/FR/X.25, PP15K, PP7K.
Italy	HUAWEI	ULL	Standard Repair	
Italy	HUAWEI	TRANSMISSION	Standard Repair	
Italy	3W POWER	Power	Standard Repair	
Italy	ABLY	Power	Standard Repair	
Italy	ADVANCED DEVICES	Power	Standard Repair	
Italy	AEG POWER SOLUTIONS	Power	Standard Repair	
Italy	ALCATEL	Power	Standard Repair	
Italy	ASCOM ITALIA S.P.A.	Power	Standard Repair	
Italy	B.T.G. SPA	Power	Standard Repair	
Italy	BRAGA MORO SIST. EN.	Power	Standard Repair	
Italy	CONVERT ITALIA SPA	Power	Standard Repair	
Italy	DELTA ELETTRONICS	Power	Standard Repair	
Italy	ELTEK	Power	Standard Repair	
Italy	Emerson	Power	Standard Repair	
Italy	Ericsson	Power	Standard Repair	
Italy	ICET SPA	Power	Standard Repair	
Italy	LAMBDA ENERGY SYSTEM	Power	Standard Repair	
Italy	Nokia Siemens	Power	Standard Repair	
Italy	OMICRON INDUSTRIALE	Power	Standard Repair	
Italy	OSAE	Power	Standard Repair	
Italy	Power-One	Power	Standard Repair	
Italy	PROMEC ELETTRONICA	Power	Standard Repair	
Italy	SAFT PW SYSTEMS SPA	Power	Standard Repair	
Italy	SICON SRL	Power	Standard Repair	
Italy	SIEMENS-ITALTEL	Power	Standard Repair	
Italy	TECNOTRANS	Power	Standard Repair	
Italy	TELETECNICA	Power	Standard Repair	
Italy	ALU	Wireline Transport (ATM/IP) & Fixed Access (ULL, mux PDH)	Standard Repair	ALU Litespan 1540 family (ATM/IP) & ALU ISAM 73XX.

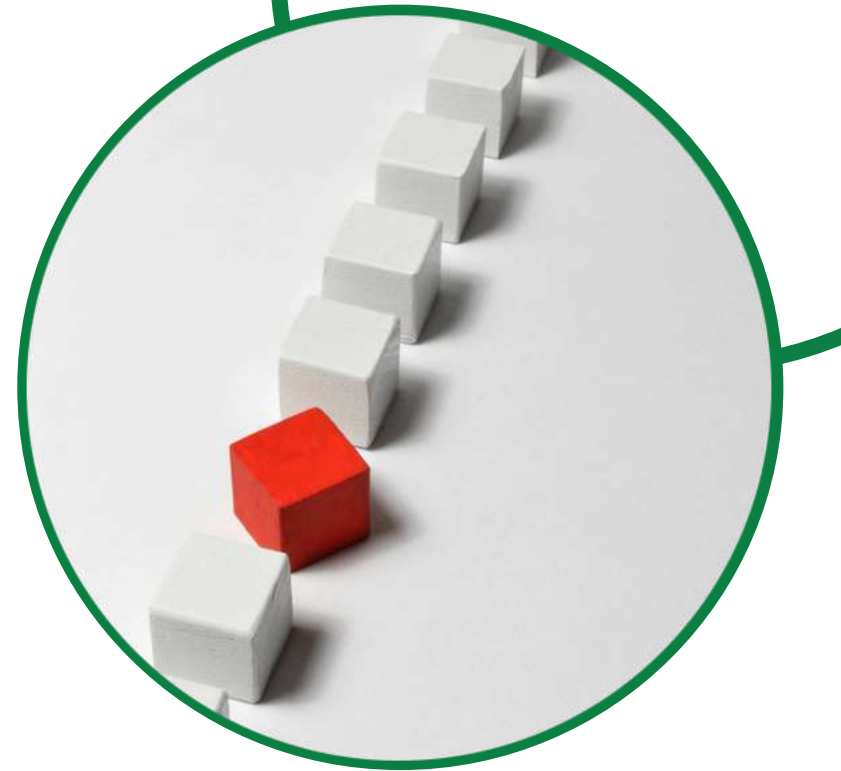


# Repair Center References – pag. 2 of 2

COUNTRY	VENDOR	TECHNOLOGY	SLA	PRODUCT
Italy	Ericsson-Marconi	Fixed Access	Standard Repair	EDA2510
Italy	NOKIA	Fixed Access	Standard Repair	ISAM, ASAM, SWITCH ATM
Italy	ADTRAN	Fixed Access	Standard Repair	HIX 5635, HIX 5300
Italy	Ericsson-Marconi	Fixed Transport (SDH)	Standard Repair	OMSxx, MSH11CP
Italy	Nokia-Alcatel	Fixed Transport (SDH)	Standard Repair	OMSN 16xx (many models).
Italy	ADVA	Fixed Transport (WDM)	Standard Repair	FSP 3000 R4, FSP 2000, FSP 1500
Italy	Infinera (ex-Siemens)	Fixed Transport (WDM)	Standard Repair	HIT 7500
Italy	BRAGAMORO	Power	Standard Repair	Many models.
Italy	Nokia, ALU	Fixed Access (ULL, mux PDH)	Standard Repair	Nokia EKSOS, ALU ISAM 73XX.
Italy	ALU	Microwave & Wireline	Standard Repair	MW LSY 9600, SDH 1660.
Italy	ALU	Microwave	Standard Repair	MW 9500 family, MW 9600 family.
Italy	Ericsson	Microwave	Standard Repair	Minilink family.
Germany	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair	Marconi/Ericsson PLTxx family.
Germany	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair	Marconi/Ericsson SPOxx family.
UK	Nokia	(Mobile Access (BTS, node B)	Standard Repair	Flexi Lite BTS 2100, Flexi WCDMA
UK	CORNING	(Mobile Access (BTS, node B)	Standard Repair	Das Mobile Access 2000 System
Germany	HUAWEI	Fixed Access (ULL, mux PDH)	Standard Repair	HONET UA5000 DSLAM
Germany	KEYMILE	Fixed Access (ULL, mux PDH)	Standard Repair	DSLAM
Germany	Ericsson-Marconi	Fixed Access (ULL, mux PDH)	Standard Repair	DMP (UA ATM)
Italy	Cabur	Power	Standard Repair	Many models.
Italy	Delta	Power	Standard Repair	Many models.
Italy	Talis	Power	Standard Repair	Many models.
Italy	Emerson	Power	Standard Repair	Many models.
Italy	CISCO	Router	Standard Repair	Many models.
Italy	RAD	Router	Standard Repair	Many models.
Italy	IT	Workstation (Windows/Linux)	Standard Repair	Many models.
Italy	Delta	Power	Standard Repair	Many models.
Italy	IT	Workstations (Windows)	Standard Repair	Many models.
Italy	IT	Workstations (Windows)	Standard Repair	Many models.
International Network	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair	Lucent SDH 1675 Extended Lambda, ALU WDM 1830 PSS 32, ALU SDH 1678, Lucent WDM OLS400G.
UK	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair	Marconi/Ericsson MHL3000.
UK	Ericsson	GSM	Standard Repair	Ericsson KDUxxx.
Germany	Ericsson-Marconi	Wireline Transport (SDH, WDM, GE)	Standard Repair	Marconi/Ericsson MHL3000.
Germany	Ericsson	GSM	Standard Repair	Ericsson KDUxxx.
Lithuania	ALU	Fixed Access (ULL, mux PDH)	Standard Repair	Router & Switch (7450 & 7750).
Lithuania	Huawei		Standard Repair	Any model.
Lithuania	Ericsson		Standard Repair	Any model.
France	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair	1850 TSS (all families).
Spain	ALU	Wireline Transport (SDH, WDM, GE)	Standard Repair	ALU SDH 1660 & ALU WDM 1626.
Italy		TERMINALS	Standard Repair	
Italy		Biomedical products	Standard Repair	Many models.

# Why Gruppo FOS for Repair Services?

- Worldwide Purchase agreement for components
- R&D services (cost reduction activities, obsolescence, etc.)
- Test Bench Design competence
- SWAP and Fast Repair Handling
- Tracking of repair Items on dedicated platform
- On Time SLA
- Logistic Services integrated with Repair
- High flexibility to cope with fluctuating repair volumes and technologies



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