ATS-UKMFT 627 In-circuit- and Function Test System for Loaded PCBs
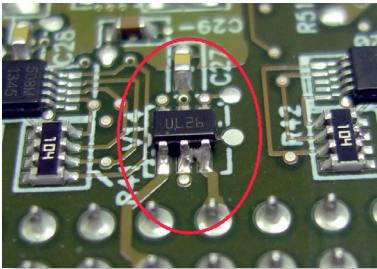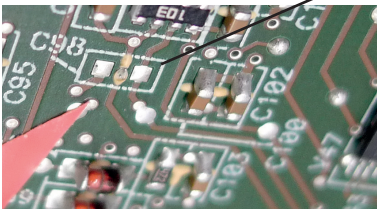

solder short circuit
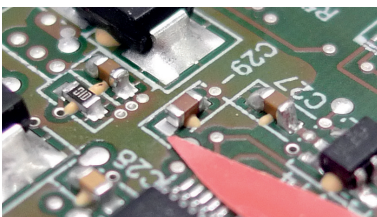
solder defect

component not mounted

graphic display of fault location:
capacitor C98 not mounted
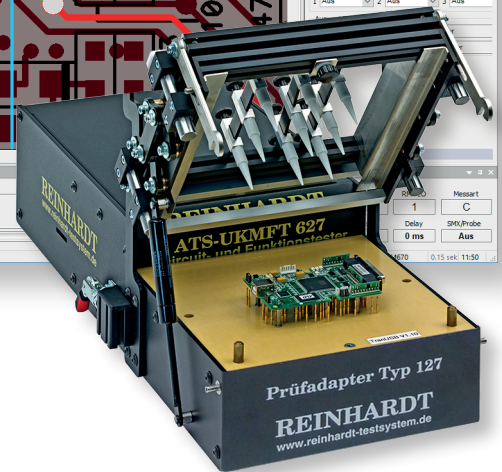
- In-circuit- and function test up to 608 measuring channels
- Power electronics, evaluation of optical displays
- In-circuit test: Pin contact, solder defects, components test
- On-board programming
- RBS100 REINHARDT-Boundary Scan
- GPIB, USB-, RS232-, I²C-interface, CAN-Bus, K-Bus, DeviceNet, LIN-Bus, Profibus, VISA-Bus, LON-Bus, EIB-Bus, TCP/IP,… partly optional
- Parallel test (RST 40), max. 2,432 measuring channel
- Transient recorder (maximum 4 channels)
- In-line-capable

- Communication interface
- Menu-driven programming with automatic program generators (APG) and autolearn
- Graphical display of fault location
- Integration of external programs
- CAD-interface RUDC10
- ODBC-interface (Open Database Connectivity)
- Statistics and fault evaluation, quality management
- Offline programming and repair station
- System diagnose for system calibration
- AAE-CNC fixture production system
- Competent, fast service by the developers

Sources	Control USB Fixture identification 2x8 Bit control bus I2C-Bus RS232 USB	Meas. Unit ICT-Function	RML32 Meas. Logic-Stimulus	RMX 96 Meas. matrix	TRA 670 Transient Recorder	In-circuit-Function Software

Sources

2x ⌽

PSU1 +24V, 1A
PSU2 +24V, 0.5A
PSU1, PSU2 -22V, 0.25A

6x ⌽

+27V, ±15V, ±5V

Fr. 0–78kHz
0–12.75Veff,
5mV, 75mHz

Control USB
Fixture identification
2x8 Bit control bus
I2C-Bus
RS232
USB

Multi-Matrix
8 relays for stimulus tasks current 2A

4fold N/O contacts (external stimul.)

Meas. Unit ICT-Function

ICT

ICT Meas. Unit

DC AC Peak

DC-AC Meas. Unit

Freq. Period Rise-Fall

Time-Frequ. Meas. Unit

Transient Recorder Fourier Distortion

Transient Recorder

RML32 Meas. Logic-Stimulus

RMX

32 Meas. Chnls.

MMX

24 Chnls. Stimulus Matrix 2 A

LOG 3.3V +5V

32 Logic Chnls.

RMX 96 Meas. matrix

RMX

96

RMX

3Wire technique expandable to 608 In-circuit and Function test channels max. 0.5 A, 100 V, 10 VA

TRA 670 Transient Recorder

Transientenrecorder Fourier Klirrfaktor

Transient recorder 50 MHz sample rate 250 MHz
8 HF 50 Ω channels
9 1 MΩ channels
resol. 250 μV all meas. chnls. can be evaluated

In-circuit-Function Software
Graphic Display of Fault Location
Quality Management Statistis Software
Software for Dealing with Gerber Files
CAD-Interface
ODBC-Interface
COM, USB, LAN (TCP/IP), I2C
Fieldbus Boards CAN, LIN, LON, …
ODT Optical Display Test
RST 40 Parallel Test
RBS 100 Boundary Scan
Test Fixture usable area max. 480 x 320 mm

MMX 670 Stimulus Matrix

MMX

48 channels in 12 busses 2 A expandable to 216 channels

⌽

2 PSUs 0 to +24 V 0 to -22 V max. 300 mA resolution U 1 mV I 10 μA

MMX 72 Stimulus Matrix

MMX

72

MMX

72 channels in 18 busses 2 A expandable to 312 channels

EMX 48 Stimulus Matrix

EMX

48

EMX

48 N/O contacts, 230 V, 2 A expandable to 192 channels

LOG 670 Logic

LOG 0–30 V

32

LOG 0–30 V

32 bi-directional channels expandable to 96 channels Logic Board 0–24 V prog. 10 mV

LOG 96 Logic

LOG 3.3V +5V

96

LOG 3.3V +5V

96 bi-directional channels expandable to 224 channels

Logic Board for 3.3 V / 5 V

PML 670 Prec.-Logic

Prec.LOG 0–30 V

16

Prec.LOG 0–30 V

16 Channels can be programmed individually 0–24 V reso. 500 μV for dricer and comparator max. 50 mA

Barcode Scanner	Function-Arbitrary Generator 1 μHz–80 MHz	POMO 80 Sources, Loads	Fixture Production System

ATS-UKMFT 627 is a combined In-circuit and Function tester. Standard modules are yellow, expansions are represented in grey.

Since 1979 we have been developing, producing and selling computer-controlled test systems are the leading producer in Germany (since 1994) and in Switzerland.

REINHARDT-Test systems are based on experience gained over 4 decades from recurring procedures. We have transformed our experience in modules. Hard- and software come from one source; needless to say, there is system responsibility and qualified service by the developer.

We have developed the ATS-UKMFT-series for customers and potential buyers with little requirement for expansion, but with the professional surroundings such as software, operation, speed, robustness and system responsibility. Many of the modules are identical with that of the successful ATS-KMFT 670.

5 board positions can be allocated individually, see block diagram. The test system is controlled via an optional, customary computer with USB-interface.

Its low price, its comfortable menu-driven software, its low follow-up cost in fixturing, in programming and maintenance

Basic Version of ATS-UKMFT 627/RML

1 combined In-circuit and Function measuring unit
128 In-circuit-Function measuring channels (max. 608)
1 Sine-square wave generator
2 programmable complementary PSUs
32 Stimulus matrix channels (max. 312)
32 bi-directional logic channels (max. 224)
5 free positions
Comprehensive menu-driven software (WIN®-based)

are out of competition and enable you to create economical test solutions for smallest series (5 to 500 units) as well as for high-volume series.

The stable and ergonomic fixtures are options. These test fixtures can be used in both In-circuit and Function test and are also ready for contacting on both sides. When you retrofit for another type of PCB, only the bed-of-nails are changed and the universal retention system is adjusted. Fixturing is very low-cost between € 350 and € 800

Programming REINHARDT-Test Systems

The menu forms reduce your entries to a minimum. The first test step which is created can be tested immediately with the test item. As programming is in forms, programs are created rapidly and can be expanded, modified, corrected or optimised.

Editing form with online display and input field

Analysing the Testability of a Test Item

With a software-tool and the CAD- and Gerber files of the PCB you can analyse its design for testability. The drilling data for creating your fixture can also be generated with this tool. A special feature in programming the REINHARDT-In-circuit test is that the bed-of-nails fixture need not be wired selectively according to a wiring list. You can wire 1:1 as you like and use a graphically guided probe for assigning a spring contact pin to a test system channel.

In-Circuit Test

The in-circuit test recognises solder defects which end in either short-circuits or breaks (cold joint) or open pins if SMT components are used. A special measuring method finds even SMT-solder defects of fine pitch ICs, of BGAs with very small programming efforts. Components such as IC-insertion and resistors, capacitors, diodes, Zener diodes, FETs, operational amplifiers etc. are tested for values and polarity. A special autoguarding method and automatic finding of delay times reduce the programming time to a minimum. Programming data can be taken from CAD-data. As there is an automatic program generator, the test program is generated in typically 2 minutes per 100 components.

In both in-circuit and function test, you just move the mouse-cursor in the graphic display and click on the resp. component pin. Then the measuring channel of the test system is displayed and you adopt it e.g. in creation. You just determine if it is the High- or the Low-channel. Then you decide if you execute an analog measurement such as e.g. UDC, UAC, UPk, distortion factor or a digital one, with a time and frequency measuring unit…

With only 1 day training 90% of our customers use the test system for production in the first week after installation!

Pin-exact graphical display of fault location

RBS 100 REINHARDT Boundary Scan

The Boundary Scan test and editing module for REINHARDT-test systems is integrated in the convenient test system menu. With the standard logic channels, it can test components which are not accessible via Boundary Scan cells, e.g. interface pins. Convenient programming via Boundary Scan e.g. of Analog-to-Digital-converters is also possible. When you create the test program, you need the Gerber files and the BSDL-data of the ICs. They are reqired for the graphical display of fault location and the connections of the ICs.

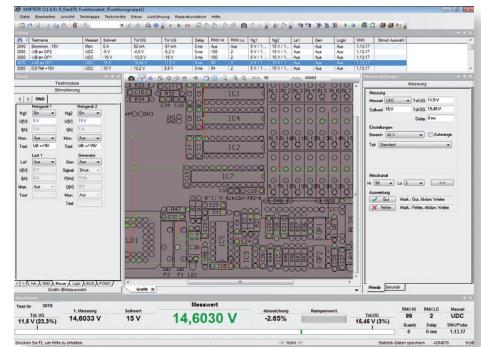*Boundary Scan Test*

Function Test

In function test, there are analog, digital, pulse, microprocessor, power electronics and power supply tests. Our modules are developed and produced in the latest technologies. We produce our modules in the best way for high speed testing and reliability in three shifts.

Programmable Voltage Sources

In the basic version, there are 2 programmable complementary voltage sources 0 to +24V/0 to -22V with 10mV resolutionThere are also 5 fixed voltage sources. PSU1+ delivers max. +1A, PSU2+ max. 0.5A and PSU1- or PSU2- max. 0.25A.
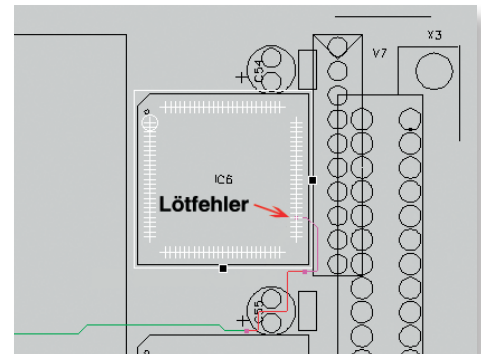
Function Generator

The quartz-precise DDS-function generator can be programmed in 0.075Hz-
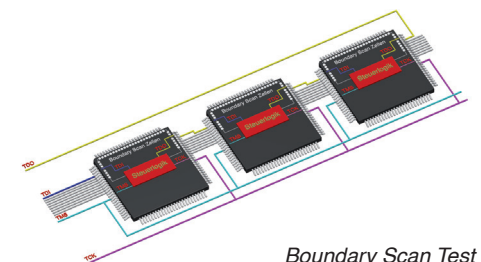

Function test editor

steps up to 78 kHz and generates sine and square wave signals at 0.25 A maximum current. Maximum amplitude sine is 7 Veff (5 mV resolution) and square wave 10 Vpp (10 mV resolution).

Function and Arbitrary Generators

The optional function and arbitrary generators for frequencies up to 20/80 MHz offer sine, square wave, triangle, sawtooth, noise, pulse signals and ramps. Arbitrary functions are for generating any curve forms. Frequency ranges from 1 μHz to 20/80 MHz with 1 μHz resolution. Amplitudes can be programmed between 20 mVpp and 20 Vpp.

Arbitrary Editor

Supporting Modules – Built Into The Test Fixture

Pulse Generator Module, max. 1 MHz, 0.2 μs pulse. **High Frequency Generator Module** max. frequency 30 MHz TTL. **High Frequency Divider** up to 1 GHz division rate 64 or 128. **Impedance Transformer** input impedance: 8 TΩ at 8 pF. **Module for Measuring Peak Voltages** up to 100 MHz. **FARBMod** and **16FARBMod** evaluate and test colours (e. g. of keys) and LEDs incl. colour and intensity from 300 to 700 nm. **Activator-Module** activates keys and switches. **Start Stop Steuerung USB-Module**

RML 32 Combined Measuring-Logic-Stimulus Matrix

The standard combined measuring-logic-stimulus matrix is made up of 32 measuring channels in three-wire technique for in-circuit- and function test with an open Guard channel. The High- and Low-channels can be switched individually 10 VA, 200 V or 500 mA, 24 stimulus matrix channels in one-wire technique, 500 V or 2 A, and 32 digital logic channels. The driver levels can be set to 5 V or 3,3 V.

MMX Stimulus Matrix

The optional stimulus matrix **MMX670** offers 48 channels in 12 bus systems, the optional **MMX72** offers 72 channels in 18 bus systems in one-wire technique for 2 A max. current or 500 V. The two 16 bit precision PSUs of MMX670 can be programmed in 1 mV-steps from 0 V +24 V, max. 300 mA. Current is programmed in 10 μA-steps from 30–300 mA.
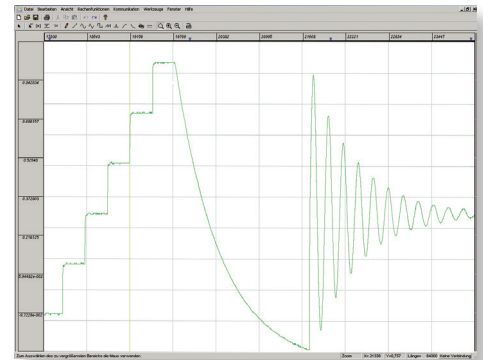

MMX670 with PSUs

Measuring Matrix

The measuring matrix has measuring channels in relay technique for both in-circuit and function test incl. time measurements. Expansion is in groups of 96 to up to 608 channels. For guarding in the in-circuit test, the measuring matrix is made up in three bus technique.

fastest In-circuit test measuring unit (Measuring speed and measuring accuracy)

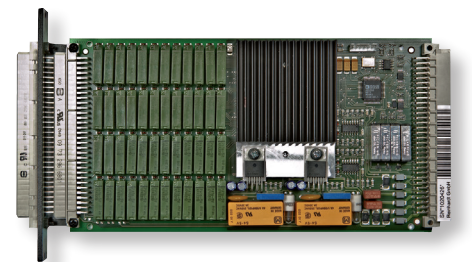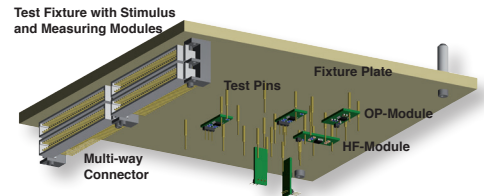### Measuring System for In-circuit and Functional Test

The 16 bit measuring system measures: DC, AC, True RMS up to 100 kHz, peak voltage, current, AC current, resistance, resistance four-terminal, frequencies, periods, pulse widths, rise and fall times, phases, pulse duty factor, events, intervals between two channels, transient recorder, sample rate 100 kHz, distortion factor and Fourier analysis.

Transient Recorder TRA670 (Oscilloscope)

The 64 k deep REINHARDT-transient recorder with 12 bit resolution offers a bandwidth of 50 MHz with max. 250 MHz sample rate. Max. input voltage is 100 V at min. 250 μV resolution. Out of the curve forms it measures parameters such as frequency, period, rise time, fall time, pulse widths, peak voltage, distortion factor, Fourier analysis etc. Curve forms are learnt via editable envelope curves and evaluated automatically. 8 HF-input channesl
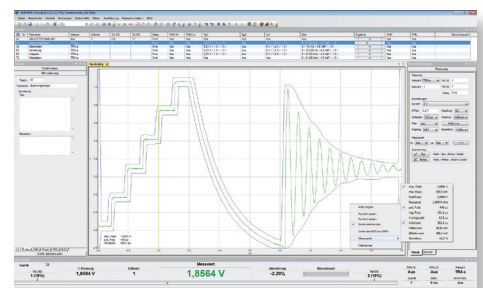

Analog transient recorder with envelope curve (blue lines)

and 9 NF-input channels are available, but the transient recorder can also be used on the standard measuring bus provided by the test system. An external trigger input is also available.

Max. 4 transient recorder can be cascaded.

Power Electronics

If you need operating voltages and currents above those provided by the standard version of the ATS-UKMFT-family, we offer a number of sources for DC-voltage (up to 300 VDC and 40 ADC), AC-voltage and electronic loads (up to 40 A).

Form REINHARDT-Synchrotest RST40

POMO80 Power Module

The linear controlled DC-module can be programmed in current (4 mA step) and voltage (25 mV) and works in the three ranges 0–30 V, 14 A, 30–65 V, 7 A, 65–80 V, 4 A. The load module can be programmed in two current ranges: 0–30 A with incr. from 10 mA or 1 mA and 0–40 A with 10 mA or 1 mA resolutions. Max.input voltage is 100 V, max. loading of each module 400 V/A. In modulation to over 50 kHz you can modulate from 0 to 100 % but program a basic current or a current curve (arbitrary) as well.

Logic Test

The Logic board (32 channels, max. 2 boards) stimulates and measures logic conditions. Logic is tested with the bi-directional drivers between 0 and 23 V. With several logic boards, you can apply and evaluate several different logic families such as 1,5 V, 3 V, 5 V-Logic up to 24 V-Logic at a time.

The programming form grants a full view of the program depth. There is a number of tools, e. g. programming components with serial interfaces with comfortable inputs such as LSB and MSB. Transducers or converters can be stimulated and/or read out. You create bus systems with automatic program generators. Autolearn also helps in creating programs.

Form for Programming Logic

LOG96 Logic Board

The 96 logic channels of this optional logic board (max. 2 boards) stimulate and measure logic signals in the 3.3 V and 5 V-technologies.
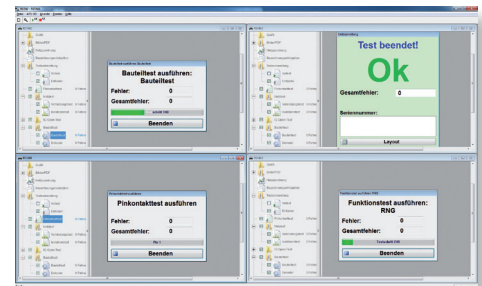
PML670 – HighSpeed-Measuring Unit, Precision-DC-Source, Measuring Unit 16 Channels and Logic

The PML670-module combines the function of a parallel DC-voltage measuring unit (16 channels 0–24 V, resolution 0.5 mV) with a 16fold DC-source (max. 50 mA) and is also used for stimulating and evaluating logic conditions. Each of the 16 channels can be programmed individually from step to step in the driver and comparator levels; each channel can be programmed with different levels (resolution 0.5 mV).
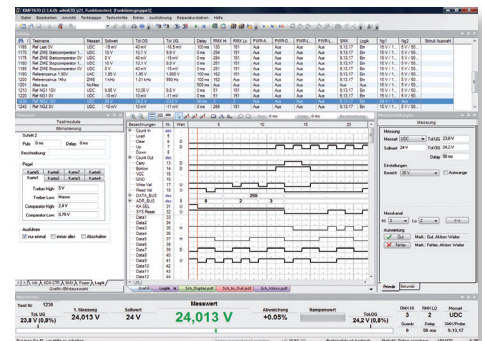

PML 670-Module

Statistics / Quality Management

All test results needed for quality management are recorded as is the good or bad status of the test item. For assessing histograms of test steps, you can check all measured values.
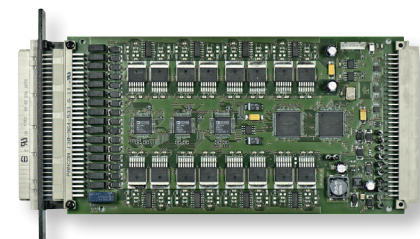
With the **Reference Test** the function of the test system and the fixture is checked and documented after a specified number of test runs or after a specified time interval.
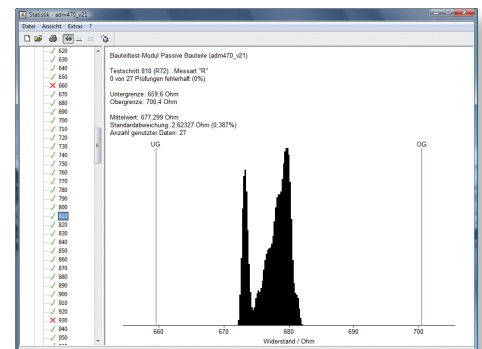

Statistics – Histogram

RDR Offline Repair Station

With the optional offline repair station, defective loaded PCBs can be repaired independent of the test system. The test system remains free from repair so higher throughput is possible.

Offline Programming Station

Our optional software can be used on any standard PC for offline program generation.

ODBC-Interface

The optional ODBC-interface helps to integrate the REINHARDT-test system in an existing quality management or in production procedures with data base management (Open Database Connectivity).

ODT Optical Display Test

The ODT-software is used for fast and fully automatic testing of LCD, LED, dot matrix, mask display, seven segment displays etc. The software evaluates fields, symbols, special characters, algebraic signs, decimal points, unit positions and seven segment displays for intensity, contrast and function.

Optical Display Test

RUDC10 CAD Converter

The RUDC10 Universal Data-Converter RUDC10 helps in the very fast creation of a test program. Out of Gencad or assembly lists, it creates the components test semi-automatically. There is also an adaptation with the Gerber data. Thus the components channels can be detected automatically. With EAGLE-Data you can also generate Gerber data with net information as well as an import-capable BOM (Bill of Materials).
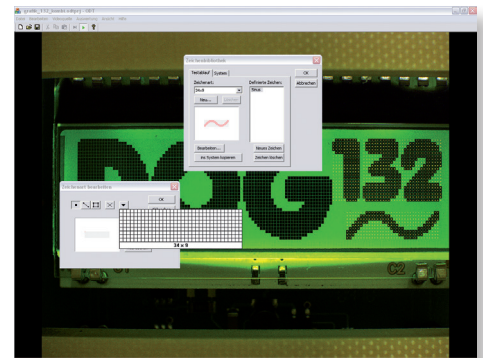

Data Converter

Building Fixtures
and Creating Graphs of Fault Location

The ATSGERBII-software for creating fixtures re-calculates the Gerber data to layouts. The graphical data are taken for fault location and used for calculating the positions of the test pins automatically. A drilling file is created out of those points. This file drills the fixture for test pins and reference pins. The CNC-drilling machine has a clamping device for our fixtures and uses the data for drilling. The contact pins, 75 mil and 100 mil, with receptacles are automatically placed into the drilled positions with an accuracy better than $10–20\mu$. The magazines can hold different types of heads. They are placed according to the developed drilling file. Test fixtures are drilled in typically 3 to 5 hours and wired in a wire-wrap procedure. Fixtures are built in an extremely cost-effective way, just-in-time and at your own site.

For more details please see our homepage on the Internet under http://www.reinhardt-testsystem. de or contact us for the more detailed salient features.

Some of the listed positions are options and do not come with the basic equipment.
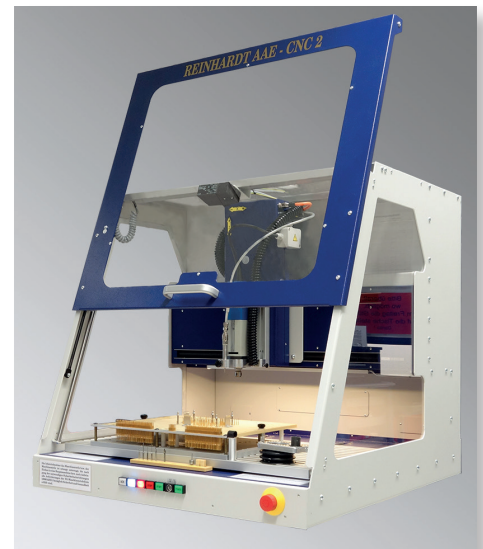All prices are net prices and nonbinding – change in price subject to change.

E & OE – Specifications subject to change without prior notice.   8/2019

Fixture Production System