TELSONIC
ULTRASONICS

Product information

# Telso®Splice TS3 & TS6 wire splicing systems

# Telso®Splice TS3 & TS6:
# Your benefits are reliable and quick connections

**The Telso®Splice TS3 & TS6 are proven, sophisticated wire splicing systems. The TS3 is perfect for small welded splices. Its light-weight and compact design makes it ideal for portable applications such as wire harnesses on assembly boards. It can also be used in preproduction and is available in a variety of table-top and standing table configurations. With its robust design, the TS6 covers the higher cross-sectional range.**
**The Telso®Splice features highly intuitive touchscreen operation. Jobs, splices and sequences can be defined easily on the screen or loaded via the Telso®CON data interface. Integration into MES environments is done via corresponding software plugins; for example, for the 4Wire CAO from Di.IT or customer-specific systems. Alongside the standard limit value monitoring, a bad parts cutter, anti side-splice accessory, wire stops and a user and rights management system help guarantee the highest level of quality.**

## Areas of application

Ultrasonic joining technology is widely used to produce reliable electrical connections in the automotive industry, as well as in a broad range of other fields. The benefits of ultrasonic wire splicing include lower electrical resistance, improved cost efficiency and a high level of protection against corrosion.
Typical applications include wire splicing in preproduction and wire harnesses on assembly boards or the compaction of wires. Copper-to-copper and copper-to-aluminum combinations can be welded with the same machine.

## Typical applications

- **Single splices and splice sequences**
- **High-voltage multi-conductor cables**
- **Twisted data cables**
- **Inline and end splices**
- **Center-strip splice**
- **Wire compaction**
- **Copper and aluminum wires**

## Application examples


Copper and aluminum inline splices

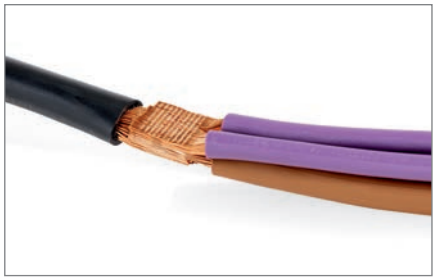

High-voltage multi-conductor cables


Twisted data cables

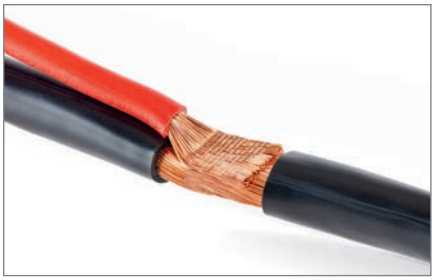
## Highlights

- Cross sections from 0.26 mm² to 75 mm²
- Suitable for copper and aluminum combinations
- Safe and reliable process
- Large cross-sectional range with the same machine
- Durable tools, quick tool changes
- Lowest costs per splice
- Easy to operate and maintain
- MES integration and customer-specific interfaces
- Production server for distributing orders between Telso®Splice systems
- Quality check with Telsonic Quality Control Center TQCC

End splices



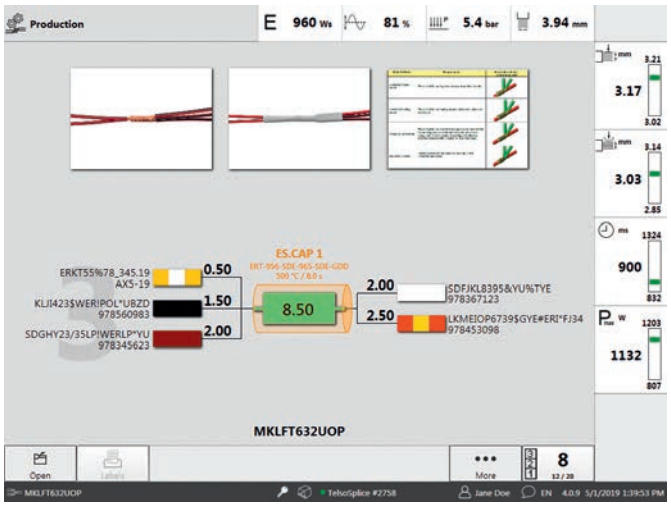
Inline splices



Wire with center-strip

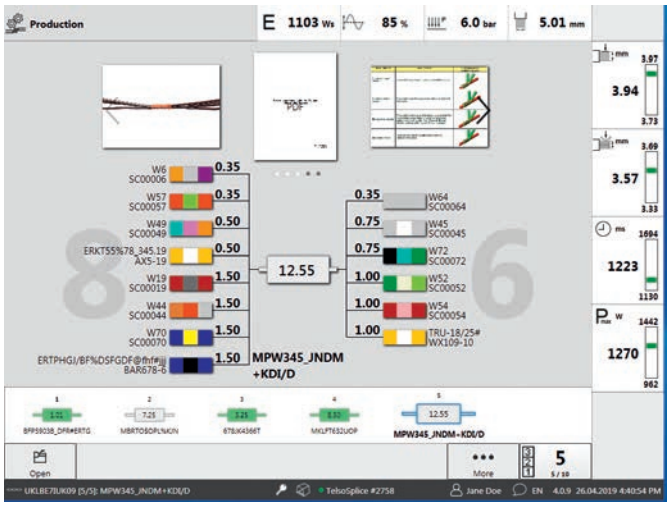
# Efficient and reliable production


The Telso®Splice features an intuitive and easy to use touchscreen operation, which works even when wearing gloves. New splices are easily created and suggested weld parameters are automatically loaded.
These weld parameters are fine tuned to work with the majority of applications. In addition, quality limits can be established and controlled by users with the required login credentials.




**SPLICE PRODUCTION MODE**

The easy to read, graphic interface displays only the information the user needs to properly operate the system. The splice diagram is displayed, along with the applied heat-shrink tube (if required). After each splice, the weld results are shown as well as their tolerances. If any of the weld results are outside of the limits, the system locks the splice until an optional bad splice cutter is activated to destroy the weld.
Images and PDFs can be assigned to each splice to provide instructions or assembly information.

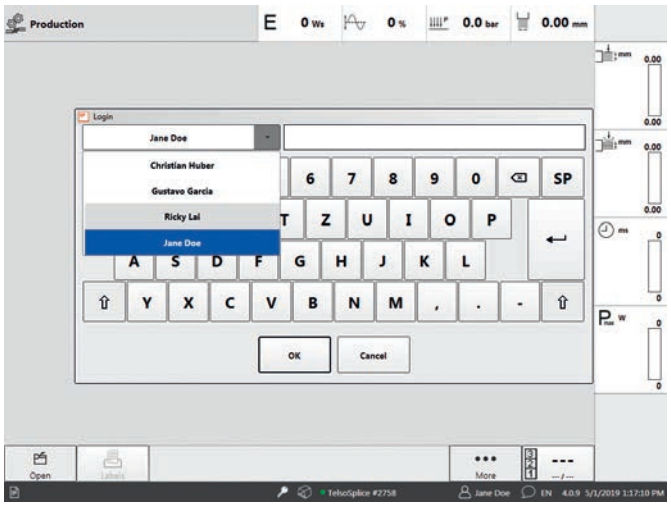



**SEQUENCES PRODUCTION MODE**

In order to produce wire harnesses, the various splices can be arranged in a sequence.
The splices are loaded and processed in the predefined order. Specific splices in the sequences can be selected directly allowing others to be skipped over as required.

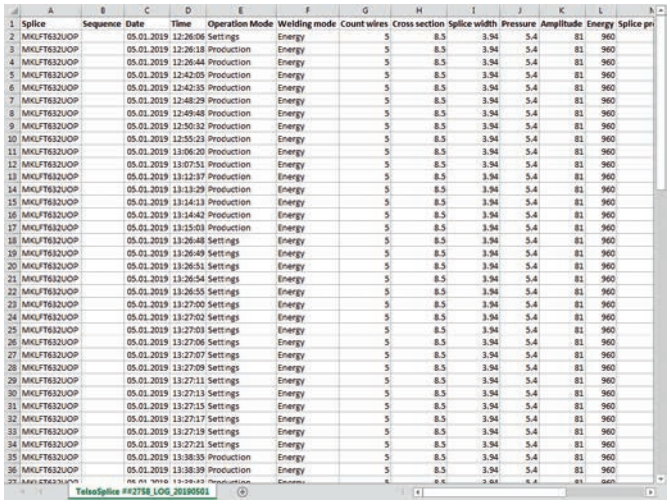

## MATERIAL VERIFICATION

To prevent mistakes during production, wires can be verified by scanning the barcodes of each part number prior to processing. It is also possible to check the age of the wires as well as verify the correct insertion side. When using this option, a splice can only be welded once it has been successfully verified.




## USER AND RIGHTS MANAGEMENT

To ensure complete traceability in production and to prevent incorrect manipulation of data, the Telso®Splice features a user and rights management system.
Users have the option to log-in to the system with a password, barcode reader or even via identification media, such as an ID card or with fingerprint recognition.

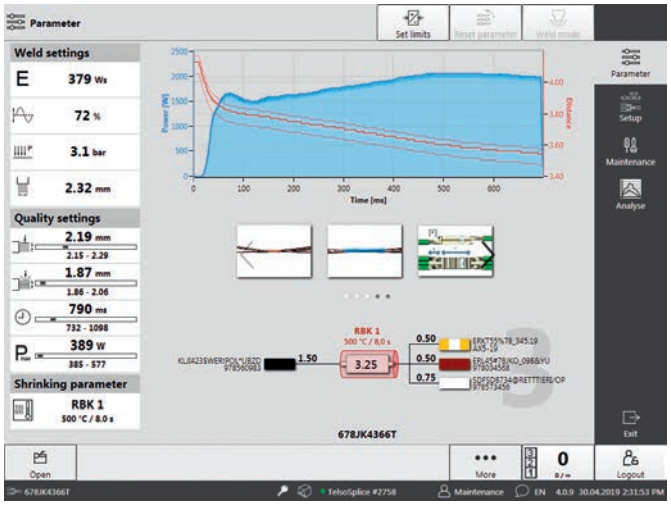


| Splice | Sequence | Date | Time | Operation Mode | Welding mode | Count wires | Cross section | Splice width | Pressure | Amplitude | Energy | Splice pr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MKLFT632UOP | | 05.01.2019 | 12:26:06 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:26:18 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:26:44 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:42:05 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:42:35 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:48:29 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:49:48 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:50:32 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 12:55:23 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:06:20 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:07:51 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:12:37 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:13:29 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:14:13 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:14:42 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:15:03 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:26:48 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:26:49 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:26:51 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:26:54 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:26:55 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:00 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:02 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:03 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:06 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:07 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:09 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:11 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:13 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:15 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:17 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:19 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:27:21 | Settings | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:38:35 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |
| MKLFT632UOP | | 05.01.2019 | 13:38:39 | Production | Energy | 5 | 8.5 | 3.94 | 5.4 | 81 | 960 | |

## WELDING RECORD

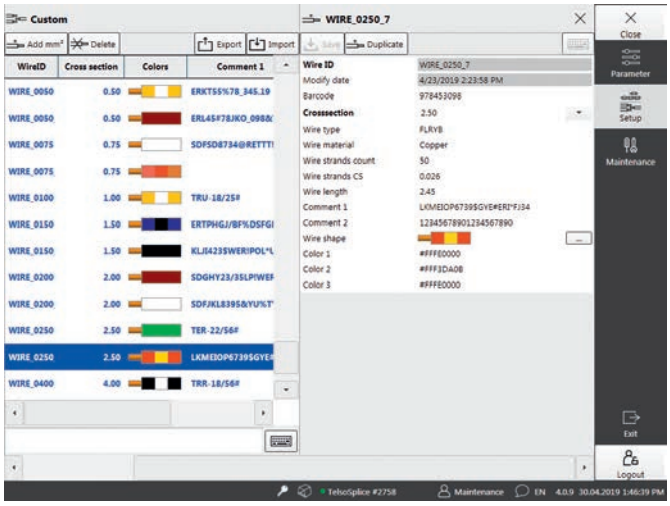
Every weld cycle on the Telso®Splice is automatically recorded, along with its production data, welding parameters and results. All data can be stored either on a network drive or locally on the Telso®Splice system.
The optional Telso®CON interface enables welding records to be customized to meet individual customers' needs.

# Effortless configuration and maintenance



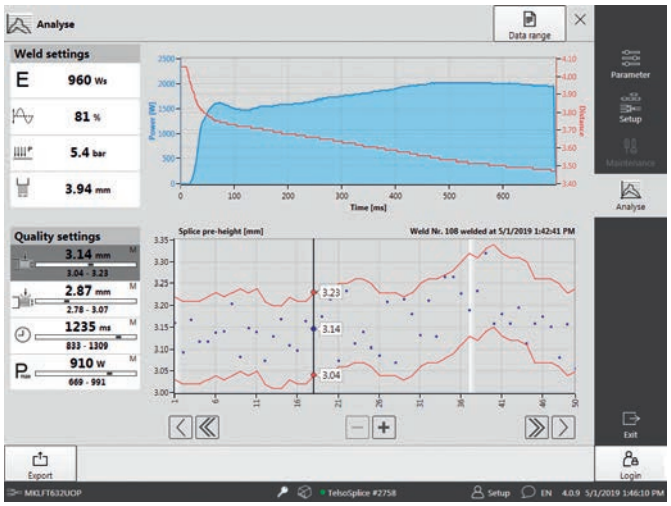

## CONFIGURATION MODE FOR EXTENDED QUALITY CONTROL

In configuration mode, users can customize splice parameters to further optimize splice quality and set quality limits for weld results. The last three welding curves are displayed to help visualize the variation in the most recent welding operations.




## WIRE DATABASE FOR TRACEABILITY

The Wire Database contains important information for each wire, such as the part number, strand count and wire type and even provides a section for comments. This information can be used for the material check and to print a label after welding. This wire specification can easily be compiled using a PC or exported from cutting area machines and then imported into the Telso®Splice system. Existing wires can be modified directly in the system and new wires can also be added manually.

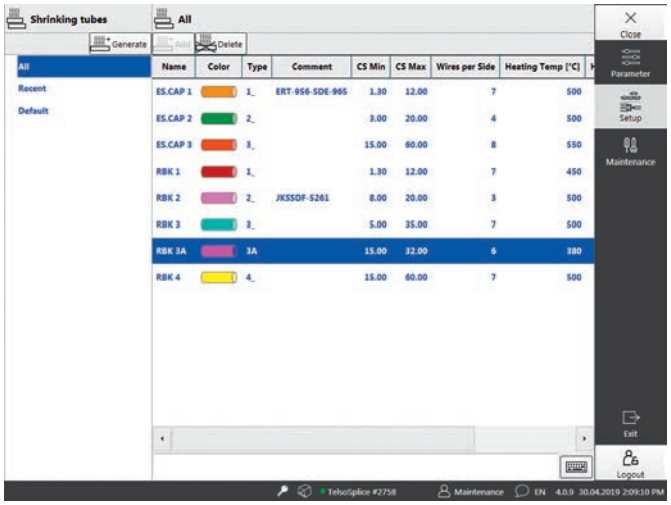



## ANALYSIS FUNCTION FOR PARAMETER OPTIMIZATION

The analysis function visually demonstrates the welding results within defined limits by plotting each weld result on a scatter plot chart. Any changes to the weld settings or result limits would be shown on the analysis screen. The bottom chart shows the option to use dynamic trend limits within fixed external limits.


## MAINTENANCE MODE FOR SERVICING

In order to maintain the system, all functions can be individually displayed, moved and checked. Service and weld counters can also be retrieved and reset depending on their authorization level.



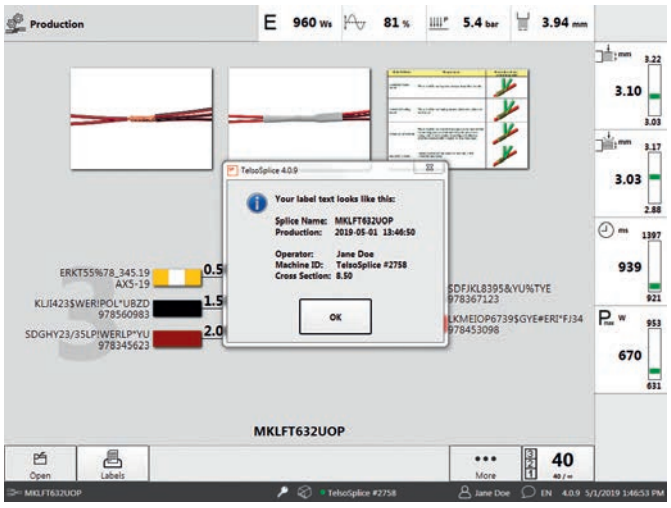

Tyco Raychem
MK series

DSG-Canusa
DERAY® series

Mecalbi
STCS series

## CONTROLLED HEAT-SHRINKING PROCESS

To protect the welded connection from the elements, heat-shrink tubing is commonly applied. The Telso®Splice can easily be integrated with various brands of shrink ovens. For each splice combination, shrinking parameters for heat and time are transferred to the oven to ensure that the process is executed correctly. To guarantee maximum quality, the shrinking process is blocked by the Telso®Splice if an incorrect weld is detected (depending on the oven type).
The Wire Database also hosts a database of heat-shrink tubes. Integrating a shrink oven with the Telso®Splice increases throughput by allowing one splice to be made while the other is being shrunk.



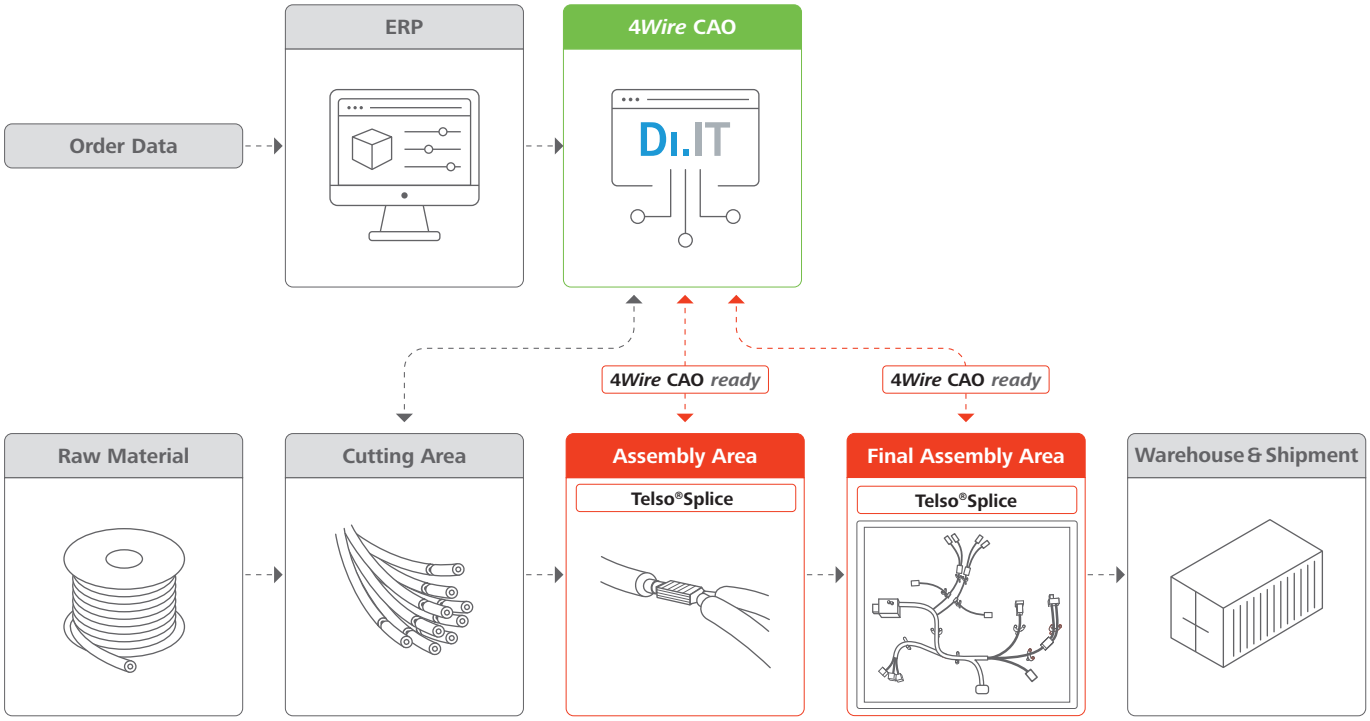

## LABEL PRINTING

Users have the option to print labels directly using standard industrial printers. They can also set when labels are printed and the information they contain, such as production data and job, sequence and splice information.

# Easy integration into Manufacturing Execution Systems (MES)

The Telso®Splice can be connected directly to the customers' MES (Manufacturing Execution System), which increases process reliability and facilitates quality assurance. The system can be integrated into the most popular MES in the industry, ***4Wire* CAO** from Schleuniger / Di.IT. Customer-specific integrations are also possible via the flexible Telso®CON interface using OPC-UA. A large number of parameters can be transmitted via this interface to facilitate the integration of benchtop systems into processes with up to 100% automation.
Once the ultrasonic wire splicing systems have been integrated into the higher-level network, orders can be transmitted automatically, complete with all technical parameters, including splice type and quantity. Production data remains transparent at all times. All parameters and results can be shared via the network and used to optimize production control. The user has access to real-time production data at any time, can access welding results and, for traceability, save the data on network drives or other storage media.

## Telso®Splice is 4*Wire* CAO *ready*



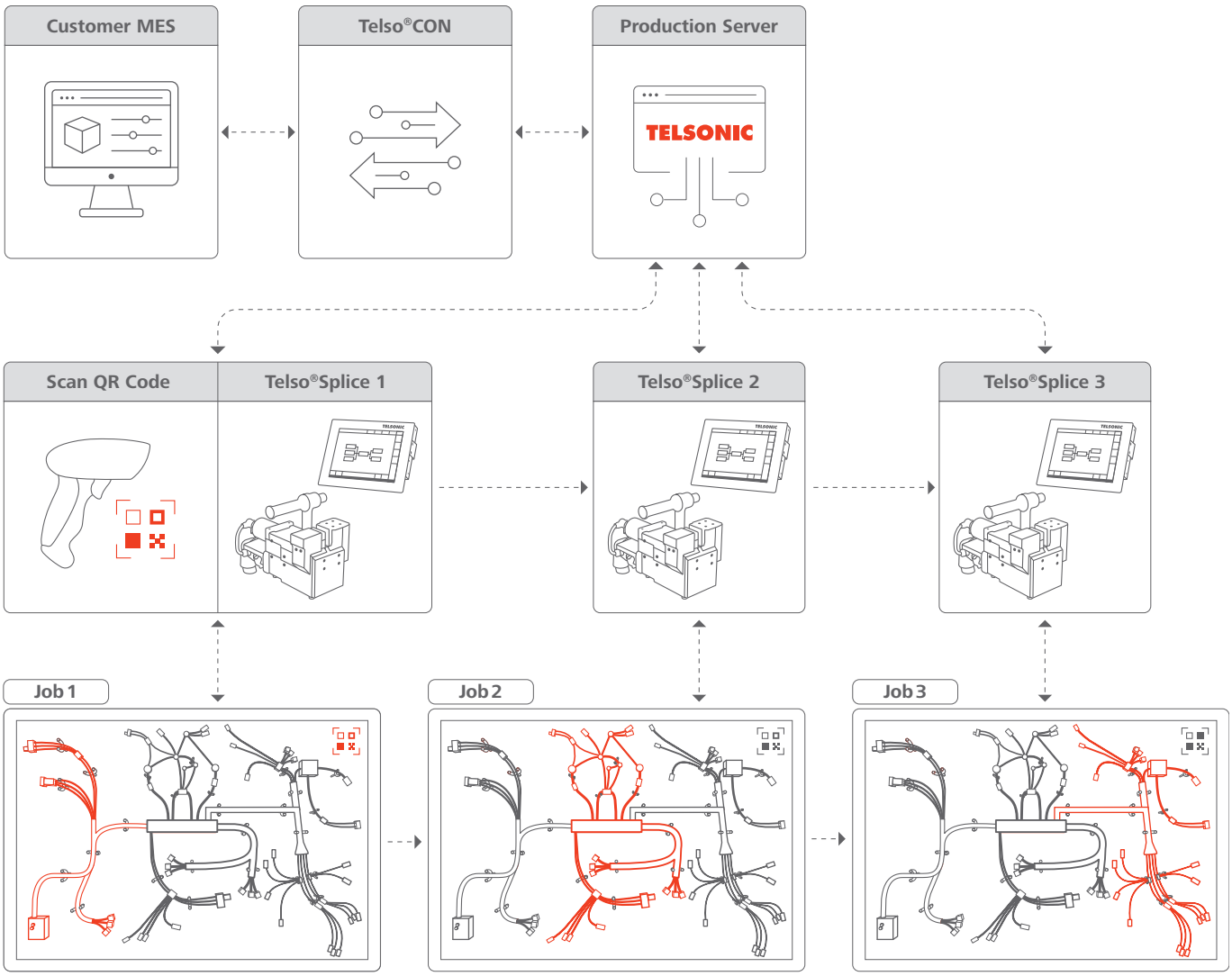

INTEGRATION CAPABILITIES

- Seamless integration with real-time data exchange
- Transfer orders including all technical parameters
- Eliminates downtime due to splice configuration on the machine
- Automatically loads the production order including quantity of welds
- Production data remains transparent at all times

EXCHANGED DATA

- Order data
- Splice and wire information
- Production results
- User information
- System data

## Telsonic production server for optimal production control




MACHINE LOAD BALANCING

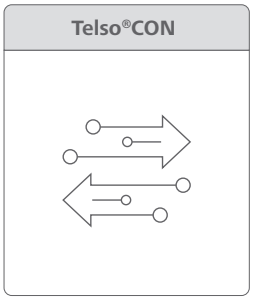
The wire harness (order) is split equally and a subsection is assigned to each Telso®Splice system in the production line. If a system is removed from the production line, the load is automatically balanced across the remaining Telso®Splice systems.

VIRTUAL RFID

Only the first Telso®Splice system in the production line has to scan the order – the other systems obtain the order automatically.

## Telso®CON: The flexible data interface

Networking and data exchange are becoming increasingly important. That's why Telsonic now offers the Telso®CON interface, a flexible solution for integrating the Telso®Splice into customer-specific MES environments. This allows jobs, nodes and sequences to be loaded automatically and each weld to be logged in the customer's own system.



# Quality control integrated in the process

Quality control integrated in the process

Telso®Splice TS3

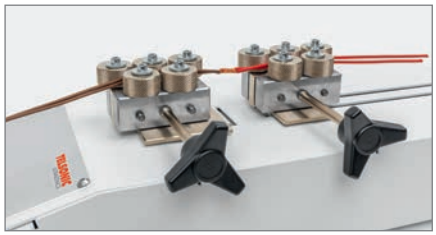
The Telsonic Quality Control Center TQCC is a weld test system used for fail-safe quality control in the production area without the need for QM personnel. The user checks the samples on the TQCC, which interfaces directly with the Telso®Splice in order to retrieve the test data
and release the machine for the next production batch or shift.
If any parameter is outside of the specification during the sample test, the machine will be blocked from operation. Tests are carried out in almost no time and customers can define the test process themselves. All tests are recorded and the data is then made available for analysis.

## Typical applications

- **Splice validation**
- **Production release**
- **Interval inspections**

## Highlights

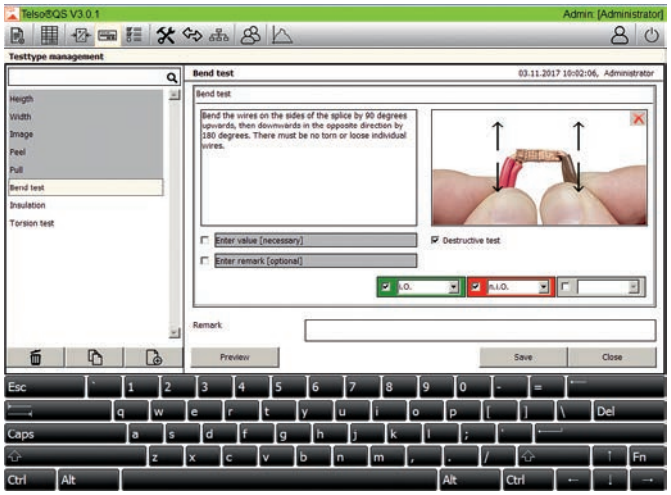
- **Complete control – stops production until the quality check has been passed successfully**
- **Saves time – splice check in shortest time**
- **Flexible – test sequence tailored to your requirements**
- **Transparency – all results are stored**
- **Supervision – user and rights management**
- **Extendable – integrate additional Telso®Splice systems**



Telso®PF for tensile strength testing

Telso®HM for height measurement

Telso®WV for visual inspection

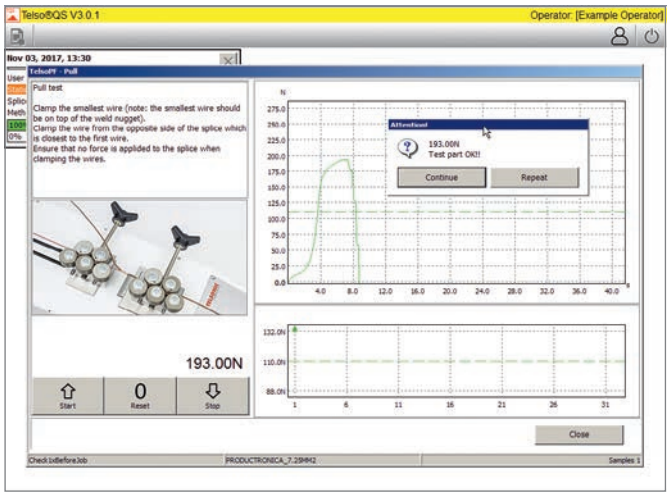



## INDIVIDUALLY CONFIGURABLE TEST SEQUENCE

The test sequences can be individually configured and adjusted to meet customers' specific requirements. Tests for series release can also be combined with interval tests or the users' own test steps. For example, bending tests can easily be incorporated. Tolerance specifications from different OEMs can also be added and allocated to a test sequence. A fully documented test sequence removes the need for hand-written test reports.


## QUICKLY ENTER JOBS

Users can enter a new production order simply by scanning a barcode. The scanned data includes the user, the splices to be produced, the batch size, the test sequence and the welding system. Users also have the option of manually entering the order details using the keyboard. The welding system is released for production once the job has been released by the TQCC.




## CONTROLLED PRODUCTION

The user produces splices until the welding system is blocked by the TQCC. A prompt immediately appears requiring the user to inspect the number of splices defined in the test sequence on the TQCC. Once the user has logged in to the TQCC, they are guided through the splice test step by step. The results are stored in table format and are made available for further analysis.
Once the test has been completed successfully, the wire welding system is re-released and the user can continue working until the next test prompt is displayed.

# Process safety and reliability

Efficient and reliable production is crucial with any wire splicing system. However, the production quality isn't just dependent on the system itself. Interferences in the structure and quality of the wire material also have an impact on the weld, and even the most skillful operators can make a mistake. The Telso®Splice system features a range of standard functions and options to help minimize the impact of these various outside influences.


**UNINTERRUPTIBLE POWER SUPPLY (UPS)**

The Telso®Splice system comes standard with an uninterruptible power supply (UPS), offering reliable protection against data loss caused by voltage drops. The data for the last splice completed is saved and the PC is smoothly shut down, even in the event of a power failure. This safeguards the data integrity of both the installed Microsoft Windows operating system and the Telso®Splice software.

**BAD SPLICE CUTTER**

If a weld result falls outside of the determined tolerance, the optional bad splice cutter destroys the nonconforming weld to ensure that the splice is taken out of production. In production mode, a nonconforming splice can only be removed from the system after it has been destroyed by the bad splice cutter. Because the machine cuts the weld making it impossible to mix with good parts, operators do not have to wait for a supervisor to continue production.

**WIRE STOP**

If a large number of end splices are being welded at the same time, the wire stop helps simplify the exact positioning of the wires, enabling more precise and efficient welding.

**ANTI SIDE-SPLICE ACCESSORY FOR AN EVEN WELD**

If four or six wires of the same cross section are stacked together in pairs and then welded, the middle of the splice will have a weaker weld connection. The anti side-splice accessory helps to prevent these so-called "side-splices".

# Multi-conductor cables and twisted wires

Multi-conductor cables are also increasingly being ultrasonically welded, including high-voltage multi-conductor cables and data conductors made from twisted wires. In these processes, it is crucial that the unshielded or untwisted wire lengths are kept as short as possible.
The Telsonic multi-conductor splice kit enables multi-conductor cables with two or more conductors to be welded efficiently and reliably. The special park position for previously welded splices keeps these splices from crowding the weld area and provides a clear view of the splices that have yet to be welded.

## Key facts

- For welding short wire ends (< 35 mm)
- Simplifies handling applications with multi-conductor cables
- Welding tool with 9 mm welding length for extremely short untwisted wire lengths
- Ergonomic housing design for clear visibility in the welding area
- High-performance cooling kit for high throughput and large cross sections

# Increase throughput

The high-performance cooling kit for the Telso®Splice TS3 reduces wait times between welds, improving throughput and increasing the time between maintenance work. The compressed air cooling also significantly reduces the surface temperature of the anvil.

## Key facts

- Highly efficient cooling
- Enables quick welding of large cross sections
- Improves the welding quality
- Increases the time between maintenance work
- Reduces the temperature of the tool surfaces

# Accessories and options

Tool case

Torque wrench kit

13 mm and 9 mm tools

Barcode reader

Foot pedal

Keyboard with touchpad

# Telso®Splice portfolio

TS3 stand table version

TS6 stand table version

Table-top version

Board version

Telso®Splice **technical data**

| | Telso®Splice TS3 | Telso®Splice TS6 | |
|---|---|---|---|
| Max. power | 3.6 kW | 4.8 kW | 7.2 kW |
| Splice cross section* | 0.26 to 40 mm² | 2.5 to 60 mm² | 10 to 75 mm² |
| Application | End and inline splices, center-strip, multi-conductor cables, twisted wires | End splices, inline splices, center-strip | End splices, inline splices, center-strip |
| Splice material | Copper, aluminum and combinations | | |

* The maximum weldable cross section depends on the material (composition, conductor construction) and quality (age, degree of pollution) of the wires. The figures shown are reference values.

TELSONIC
ULTRASONICS

## Your Contact

www.telsonic.com

This brochure may show parts which are available as options rather than as part of the standard equipment. In some cases, safety covers have been opened or removed in order to show machine details more clearly. Subject to changes to dimensions, design and equipment. See separate data sheets for technical data.

Certified to ISO 9001 & 14001

666004054 / 0922 / en / Subject to technical modifications