




# TPS/i

Robotics





Where innovation and  
outstanding performance  
come together

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# Robotic welding



We combine a culture of innovation and customer focus in a unique way: since the 1990s, we have been revolutionizing the industry with pioneering solutions for robot-assisted welding.

By making good things even better, we not only develop welding systems, but also create solutions that expand the possibilities of automated robotic welding. We achieve a high quality weld thanks to intelligent control and a stable arc.

Software solutions allowing easy integration plus welding data recording and analysis complete our systems.

- Accurate welds
- Fewer rejects
- Energy-efficient
- Minimal downtime thanks to simple maintenance

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## The advantages for you



Transformation for maximum efficiency

Converting a manual welding machine to a robotic welding system is quick and easy. All common standard interfaces are available.



Overview of production

WeldCube is a central tool that networks and monitors all welding machines in production, so you can fulfill any documentation requirements. Plus, the component-related evaluation of process data allows you to optimize your production line and realize its full potential.



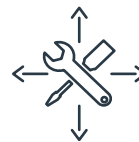
Easy upgrades

The system's functionality can be quickly expanded using software options and welding packages.



Ready for use in no time

The TPS/i facilitates quick and straightforward communication with robots from different manufacturers, ensuring rapid integration of the welding system.



Multipurpose for any application

Our welding system is versatile. No matter whether you're working with aluminum, CrNi, or steel, the TPS/i ensures optimum welded joints. With our solutions, you remain flexible and fully equipped for future challenges. The result: perfect welds with excellent support.

## Versatile and precise

Equipped with two to three perfectly synchronized wirefeeders, the PushPull system ensures extremely precise feeding. Accurate wire feeding forms the basis for high process stability, especially for long wire feeding distances and applications with aluminum alloys or CuSi.

# PushPull systems



## Perfect results every time

Easy handling and low maintenance: the system is most frequently used in applications such as CrNi and steel, where consistent quality and high system availability are required. The assistance systems of the LSC and PMC processes help deliver outstanding welding results.

# Push systems



Fully compatible with our

# welding packages

Thanks to our modular welding packages, custom solutions can be developed quickly and efficiently. The TPS/i can be flexibly adapted to meet specific welding requirements. The standard or pulse processes are available as basic packages, or advanced welding packages such as LSC, PMC, or CMT can be used for particularly demanding welding tasks. The optimum interaction of welding processes with intelligent penetration and arc length stabilizers makes production faster and of higher quality, which reduces rejected welds to a minimum.



		Standard	LSC	Pulse	PMC	CMT
Areas of application	Sheet thickness up to 1 mm	●●●○○	●●●○○	●●○○○	●●●○○	●●●●●
	Sheet thickness between 1 and 3 mm	●●●○○	●●●○○	●●○○○	●●●○○	●●●●●
	Sheet thickness upwards of 3 mm	●●●○○	●●●○○	●●○○○	●●●●●	●●●○○
	Welding in position	●●●○○	●●●○○	●●○○○	●●●○○	●●●●●
	Welding speed	●●●○○	●●●○○	●●○○○	●●●●●	●●●●●
	Welding with 100% CO <sub>2</sub>	●●●○○	●●●○○	○○○○○	○○○○○	●●●●●
	Spatter prevention	●●○○○	●●●○○	●●○○○	●●●○○	●●●●●
	Mechanized root passes	●●●○○	●●●○○	●●○○○	●●●○○	●●●●●
Materials	Steel	●●●○○	●●●○○	●●●○○	●●●●●	●●●●●
	CrNi	●●●○○	●●●○○	●●●○○	●●●●●	●●●●●
	Aluminum	●○○○○	○○○○○	●●●○○	●●●●●	●●●●●
	Other materials	●●○○○	●●●○○	●●○○○	●●●○○	●●●●●

The stable arc with  
reversing wire motion

# CMT

Cold Metal Transfer: The highly specific type of droplet detachment minimizes heat input. Reversing wire motion also ensures low spattering.



**99%**  
less spatter\*

**33%**  
lower heat input\*

A stable arc with  
no exceptions

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- Perfectly suited to high-strength steels
- Not susceptible to external influences (changes in stickout or workpiece surface)
- Suited to 100% CO<sub>2</sub>

Faster welding

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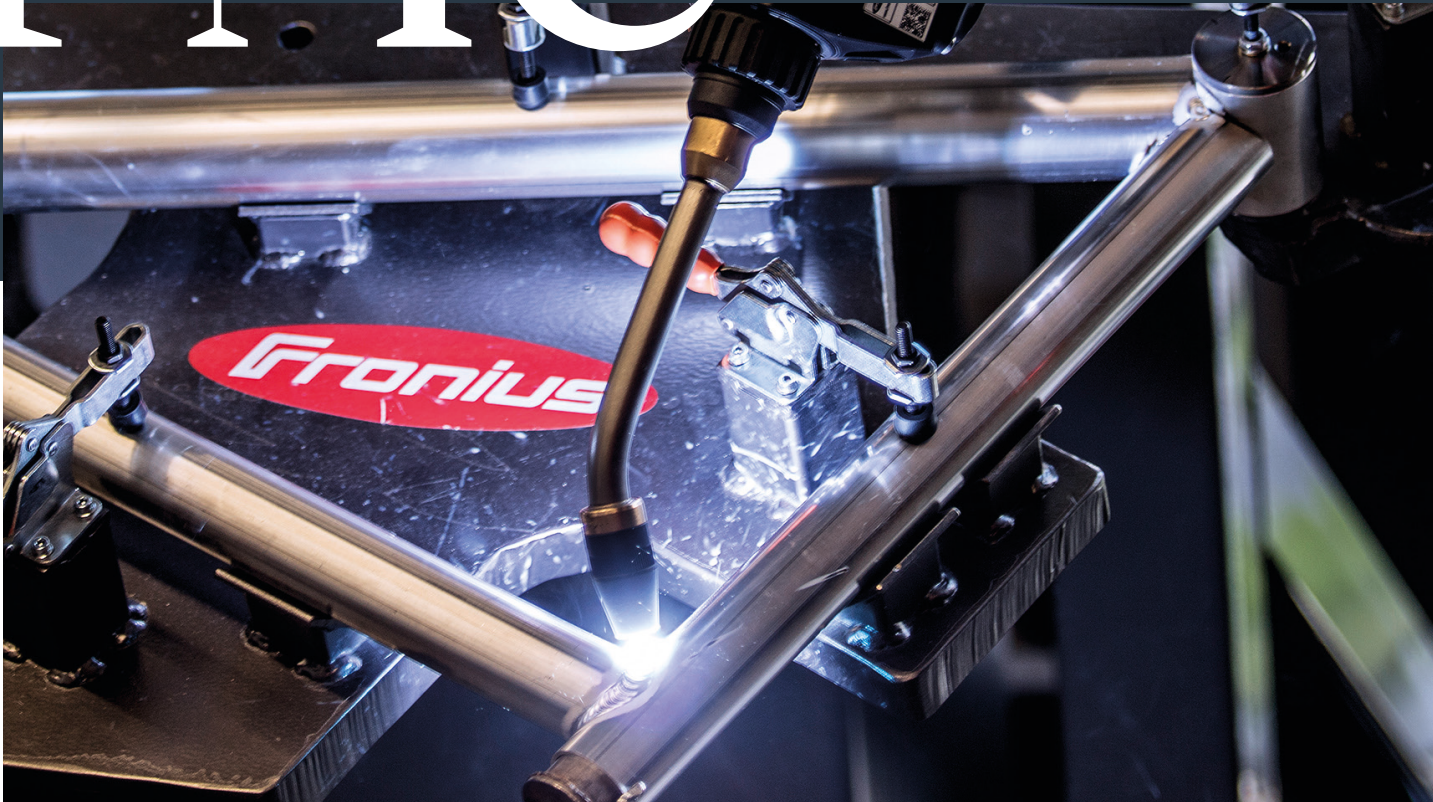
- High speed but the same penetration
- Fast joining of thin sheets
- Spatter-free ignition (SFI)

\* Under laboratory conditions

The optimized pulsed arc

With its optimized pulse characteristics, Pulse Multi Control provides high-quality welds at high welding speeds.

# PMC



## High weld seam quality and appearance

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- Increased process stability thanks to arc length stabilizers and penetration stabilizers
- Spatter-free ignition (SFI)
- Optimized for welding vertical-up seams without pendulum movement due to PMC mix
- TIG-like seam rippling thanks to PMC Ripple Drive

## Improved weld properties\*

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- Consistently greater penetration
- 15% higher welding speed
- 15% less heat input

\* Compared to a conventional pulsed welding process

The modified dip transfer arc

# LSC

Low Spatter Control: Soft reignition represents a significant difference compared to the standard dip transfer arc. Here, the short circuit is resolved at a low current level. This results in a stable welding process.



Weld up to 4.5x  
quicker\*\*

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- Very well suited for out-of-position welding
- Welding in the vertical position is optimally supported by the properties of LSC
- The powerful arc ensures optimum root formation in overhead positions

Up to 75% less  
spatter\*\*\*

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- Less rework
- Lower consumption of filler material
- Fewer rejects
- Less cleaning required and savings on wear parts

\*\* Compared to TIG root pass welding

\*\*\* Compared to standard arc at 6 m/min wire speed, 5 mm unalloyed steel

Faster, more accurate  
welding with

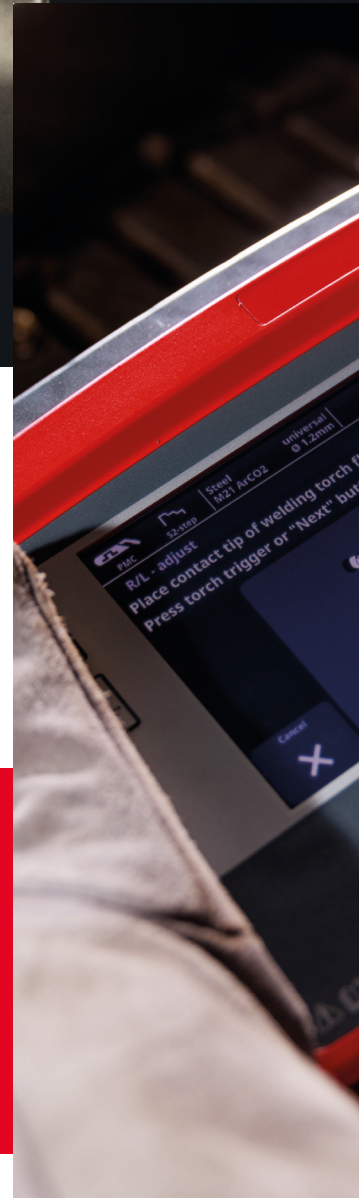
# assistance systems



We focus on connections—between people, industries, and metals. Find out more here.

[www.fronius.com/welding/aboutus](http://www.fronius.com/welding/aboutus)

Connected  
by welding | United  
by passion



Our assistance systems such as TeachMode, TouchSense, WireSense, and SeamTracking further optimize the welding process by saving time, preventing collisions, compensating for tolerances, and increasing process reliability.



## WireSense

Uses the wire electrode as a sensor

Imprecise clamping fixtures and minimal material differences can have a negative influence on the welding result and cause costly, time-consuming rework. With WireSense, these problems are a thing of the past. The wire electrode measures component deviations such as varying air gaps or clamping tolerances and transmits the values to the robot.

## SeamTracking

Tracks seams during welding

The SeamTracking robot assistance system plays an active part in the welding process. The robot automatically corrects the seam path based on changed parameters by means of pendulum movements. This ensures precise tracking of the seam path, avoiding welding errors due to voltage and component tolerances.

## TeachMode

Keeps the stickout constant

The wire electrode retraction function offers several advantages for the efficient programming of welding positions on the robot. Retracting the wire before a collision prevents the wire from bending, thereby keeping the set stickout constant. This saves a considerable amount of time as manual corrections are no longer needed, while the welding quality remains constant. The system is also compatible with all common filler metals, increasing the flexibility and efficiency of the welding process.

## Short Circuit Detection

The welding system detects accumulations of welding spatter inside the gas nozzle. Cleaning routines can be optimized and process reliability increased.

## TouchSense

Perfect alignment with the component

Before the welding process, the exact position of the workpiece is determined by scanning with a wire or gas nozzle. This allows the robot controller to compensate for the component position.

Welding systems with

# vision

## SmartManager

### Managing digital welding machines

The SmartManager is a web-based solution in the field of welding technology. As part of the welding system, the SmartManager provides advanced setting options. Data acquisition and control minimizes downtime and provides detailed insights into the performance of the welding system.

### Efficient management made easy

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- Convenient access: Manage the overall system and all settings conveniently via PC or tablet
- Comprehensive data documentation: Get complete data documentation at a glance, with export function
- Signal visualization and system overview: Gives you an overview of all signals and the system
- Efficient job management: Create, compare, and process jobs quickly and easily
- Always up to date: Always stay up to date with the latest updates
- Backup & restore: Easy backup allows you to seamlessly restore data when replacing hardware



Simple integration of  
your welding machines  
via LAN/WLAN

## User management

Wondering how you can assign and manage authorizations centrally for several welding systems? A standalone solution in the WeldCube portfolio, Central User Management, provides the answer. You can assign individual authorizations to each user via the authorization system integrated into the TPS/i. When someone logs in with a key card or fob, the system immediately knows what they are (and are not) allowed to do. With just a few clicks, user rights are set centrally for one or more welding systems. The relevant information is automatically sent to all connected systems.

## WeldCube welding data management

With the WeldCube software portfolio, we are expanding our welding systems across the entire welding technology production process. Simplified workflows, structured processes, faster training of untrained workers, and standard-compliant welding all support users in manual welding production. We are your partner for perfect welding quality, increased productivity, and transparency. With the correct welding system and the right software solution, you are already equipped for the challenges of tomorrow and can optimally unleash your welding potential.



For more information, visit  
[www.fronius.com/tpsi-robotics](http://www.fronius.com/tpsi-robotics)



## Sustainability defines **our actions**

Thanks to its modular structure and customized software packages, the TPS/i can be easily adapted to suit individual welding requirements, thereby saving valuable resources.

Lower consumption and less welding spatter: Optimized welding processes such as CMT or LSC help to reduce welding spatter by up to 75%\*. On the one hand, this means that less filler material is required. On the other, time-consuming and cost-intensive rework is reduced. By using the latest technology, we help to take the pressure off people and the environment, and to safeguard the future for subsequent generations by making it one worth living in.

\* Compared to a conventional welding process

## The highest service quality

A reliable partner  
with a global presence



Fronius is active and present in almost all countries worldwide. With 34 international Fronius companies and sales and service partners and representatives in over 60 countries, we are always available for our customers. Our global sales and service network ensures the best customer service. Rapid support when needed minimizes downtimes and saves customers money.

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