SOLUTION GUIDE

CUSTOMIZABLE TRUNK SOLUTION CTS

Flexible, Plug-and-Play Electrical Balance of Systems EBOS built for long-term durability.

GREATER DESIGN FLEXIBILITY FOR FASTER, MORE EFFICIENT SOLAR DEPLOYMENT

- Electrical Balance of Systems EBoS design directly impacts project cost, installation speed, and long-term operational reliability.
- Traditional EBoS architectures often restrict layout flexibility.
- As utility-scale solar projects grow in scale and complexity, developers and EPCs require an architecture that adapts to real-world site conditions, evolving layouts, and schedule pressures.

HOW CAN WE HELP?

TE Connectivity (TE)´s Customizable Trunk Solution CTS transforms conventional EBoS into a configurable, trunk-based architecture easy and fast to deploy that adapts to changing site conditions when they arise.

INSTALLS EASIER

EASE OF USE WITH PLUG & PLAY COMPONENTS

The CTS architecture has been designed to enable fast and simple installation with plug and play components.

The Solar IPCs require no cable insulation cutback and the PV wiring harnesses come pre-assembled with embedded fuses, reducing labor time and costs.

The disconnect boxes hold just 5 terminations. This helps to reduce the risk of overheating, ensuring electrical power continuity. There is also little or no need for maintenance of the boxes.

PERFORMS SMARTER

DESIGN FLEXIBILITY, COMPATIBLE WITH ANY MOUNTING STRUCTURE

The PV wiring harnesses and Solar IPCs offer high flexibility in the design of your solar farm, enabling you to choose an East-West or North-South trunk cable orientation.

The disconnect boxes can be clustered at strategic points, considerably reducing the lengths and cost of aluminum cable required. An above ground cable management system increases the ampacity of cables by 20-30%, removes the need for extensive trenching and makes it easier and safer for Operations and Maintenance staff to perform their tasks.

RUNS LONGER

HIGH PERFORMANCE EVEN IN THE TOUGHEST ENVIRONMENTS

Thanks to our engineering expertise and investment in materials science, the components of CTS have been designed and manufactured to high quality standards.

They are certified and tested to perform even in the harshest environments - including extreme temperature variations, UV exposure and moisture - ensuring reliable operational performance throughout the lifetime of the solar farm.

OUR COMPONENTS ARE COMPATIBLE WITH ANY TRACKER MANUFACTURER.

Customer Case Study

Region
North America

Project Type
75MW Solar Farm

Design Flexibility
Re-configured on-site

Budget Protection
Zero Change Orders

Schedule Adherence
On-time Execution

Customer Challenge

As the land was being prepared for the implementation of CTS, a sacred burial site - including valuable archeological artifacts - was incovered. The on-site team had to find a way to re-configure the solar farm layout, without disturbing the protected area.

TE Solution

The complete CTS bundle consisting of:

- Solar Insulation Piercing Connectors SIPCs, PV wiring harnesses and disconnect boxes, according to the preliminary block design.
- On-site training on how to install and configure the solution based on EBoS architecture.

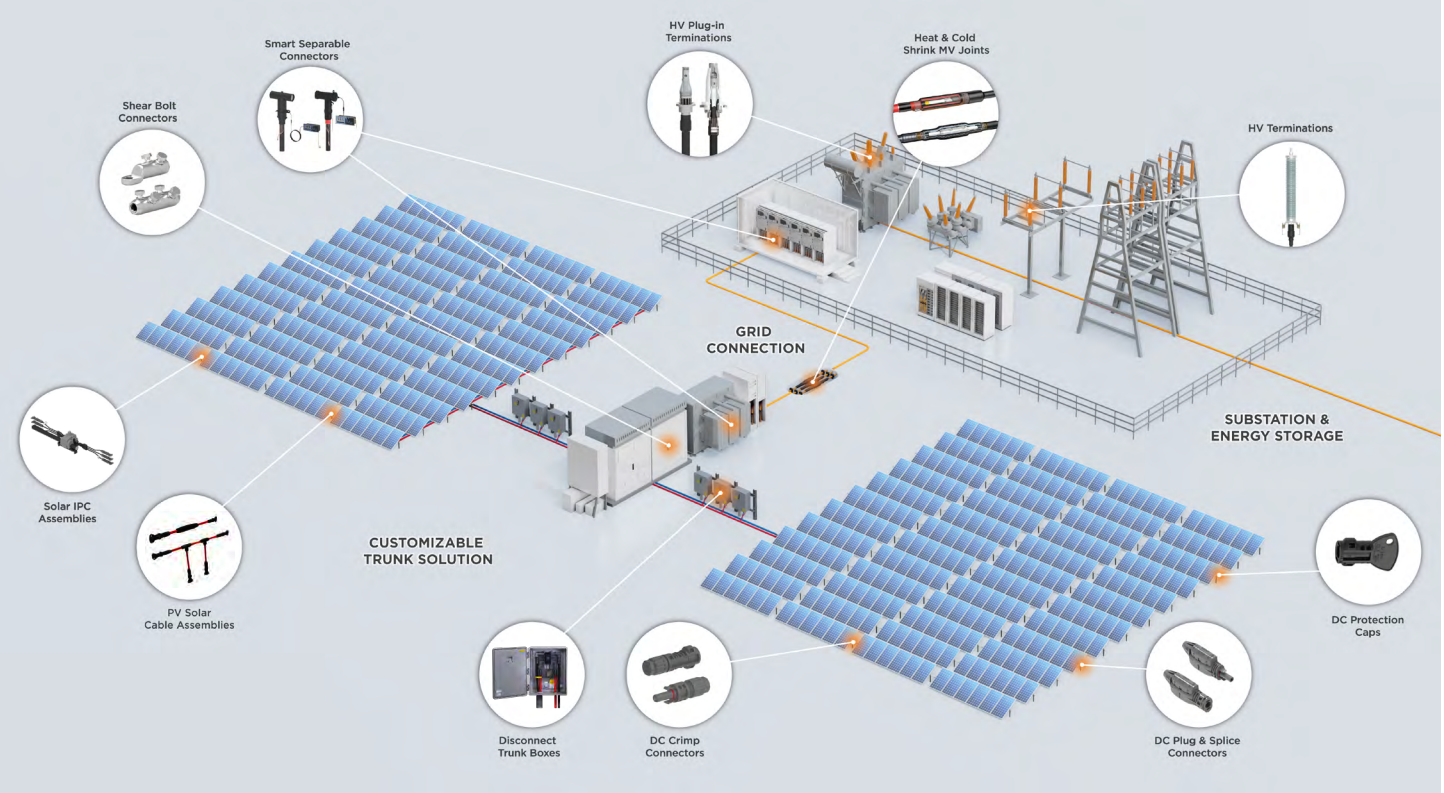
As the project progressed, the area that required protection was found to be much larger. This required additional modifications until the 'As Built' layout was achieved thanks to the adaptability of CTS architecture.

Outcome

- Zero Change Orders and zero liquated damages.
- 12 MW area reconfigured in the field with new block design, maintaining the project budget and implementation velocity and more!

Read the full case study and other customer stories in **TE.com/cts**

An optimized, high-performing EBoS

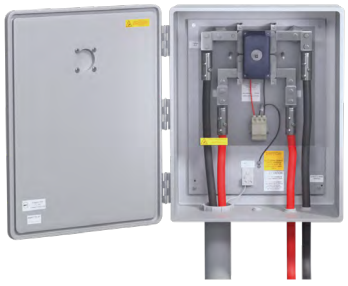


+ Reduced Cost of Ownership
+ Wildlife and Asset Protection

+ Easy, Fast, Safe Installation
+ Installer & Engineering Support

+ Grid Monitoring
+ Grid Reliability

A configurable EBoS solution built around a trunk-based architecture. The three components of CTS are:

SOLAR IPC ASSEMBLIES	PV SOLAR CABLE ASSEMBLIES	DISCONNECT BOXES
		
Provide insulation piercing technology for fast, safe connections with no insulation cutback.	Provide inline overcurrent protection close to the panel, with a pre-assembled and customizable design.	Protect low voltage systems from power surges and reduce the number of cable terminations required.

TE´s Customizable Trunk Solution CTS has been engineered to address the limitations of a traditional EBoS architecture and bring more flexibility, reliability and efficiency to your solar farm.

CONCEPTS	TRADITIONAL EBoS	CUSTOMIZABLE TRUNK SOLUTION CTS
DESIGN & LAYOUT	Restrictions to adapt the design and layout of solar farm.	Full flexibility with N-S and E-W orientation.
CABLING REQUIREMENTS	Requires large lengths of copper string cable which are expensive.	Up to 3x less copper string cables required.
	Loose cables and connectors are prone to breaking and can damage the PV back sheet.	Optimized assembly management with short jumper wires and secure connections to the trunk bus cable.
INSTALLATION	Time-consuming installation, prone to human error.	Easy installation using standard tools and plug and play components.
	Expensive trenching is required to bury the cables underground.	Flexibility to choose below or above ground cable installation.
	Combiner boxes must be placed close to the PV panels.	Only 5 terminations meet in each disconnect box which can be clustered and placed close to the inverter.
RISK LEVEL	High risk of overheating due to the number of electrical components in each combiner box.	Low risk of overheating due to reduced number of electrical components within the disconnect boxes.
MAINTENANCE	High maintenance demands on Operations & Maintenance teams.	Little to no maintenance required.

ENGINEERING PARTNERSHIP FROM DESIGN TO DEPLOYMENT

From initial layout planning to final commissioning, our engineering teams partner with solar developers and EPCs to optimize EBoS architecture for performance, efficiency, and constructability.

You can count on our technical expertise for:

- Design consultancy including drawings, calculations, and layout optimization
- Installation efficiency analysis
- Customized in-field training for installation teams
- Technical guidance and support after implementation

TECHNICAL DATA

Solar IPC Assemblies

Our Solar IPC assembly offers protection, insulation and high-quality sealing, connecting PV cables easily and safely.

FEATURES

- UL/cUL and IEC certified[1]

Designed to connect PV cables up to 1500 V

- Bus cable: single and double insulated stranded (class 2) Al cables
- Wiring harness: single and double insulated flexible (class B and class 5) Cu cables
- PV cables range up to 1000 kcmil and 400 mm^2

IEC & UL/cUL Compliance

- EN 50483-4 (reference standard in Europe for IPCs)
- Applicable tests from IEC 62852 (Solar DC mate cable connectors)
- UL 486A-B, CSA C22.22
- UL/cUL 9703
- Made with UV-stable and impact-resistant plastic raw materials
- Flammability class: V0 UL 94 & IEC 60695-11-10, -20
- UV-stable and impact-resistant housing with a latch that protects against humidity and water
- One piece connector block with shear bolt technology
- Halogen-free, UV-resistant, flame-retardant

BENEFITS

- Engineered and designed for solar applications
- Easy to install with standard tooling
- Wide range of cable sizes for lower voltage drop and higher current capacity
- No insulation cutback required
- Tightening torque simplifies installation hence no maintenance required
- Watertight connection thanks to elastomeric seal prevents any contaminants or moisture entering the connection
- Provides a reliable transition from copper to aluminum
- Low leakage current
- Suitable for outdoor applications
- Adjusts to connection spacing on-site
- Functions as a tap connector on a mid-span or dead-end application

[1] Further information on our product certifications and tests is available on request.

PV Solar Cable Assemblies

Our PV solar cable assemblies are versatile and adaptable to different solar farm applications. They provide protection close to the panel with pre-assembled, embedded fuses.

FEATURES

- Designed for solar farm applications up to 1500 V and 60 A with multiple gauge options #12 AWG - #6 AWG and 4 mm^2 – 16 mm^2
- Range of fuse protection from 5 A to 80 A
- Various harness configurations available: inline overmolded fuses, branching, whips and string jumpers
- The harnesses are labelled with a unique serial number/bar code for traceability purposes
- Available in different wire colors and cable wire sizes
- UL 9703 compliant – exceeds 4x aging and environmental requirements
- 100% compatibility with panel manufacturers

BENEFITS

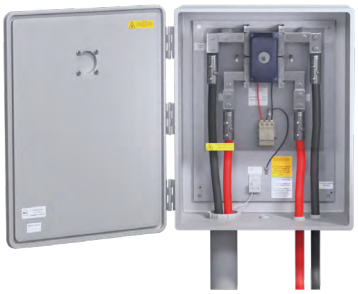
- Each cable assembly is tested before shipment and must pass a series of tests (e.g. resistance, weight, submersion leakage) to help ensure reliability and durability

Disconnect Boxes

The CTS architecture eliminates the need for combiner boxes. We use a disconnect box which is quick and easy to install.

FEATURES

- Disconnect boxes are rated for 1500 V and 400/500 A load break with surge arrestor and common ground capabilities
- Polyester enclosure reinforced with fiberglass and UV-resistant
- NEMA 4x rated corrosion protection
- Surge protection device type I or I+II
- 5 connections required to complete the installation
- Up to 4 inputs per disconnect box
- Range of output conductors up to 1000 kcmil and 400 mm^2
- Designed according to IEC 61439—2
- UL 1741 listed



BENEFITS

- Simple design with two trunk bus input and two output connections
- Keeps temperature stable, reducing the risk of overheating and power loss
- Almost 3x faster to install than traditional combiner box (45 minutes vs 2 hours)
- Boxes can be clustered strategically and placed closer to the inverter in order to save on trenching and DC feeder cable costs
- Equipped with shear bolt connectors for easy installation (optional)

WHAT YOU GET WITH TE

EXPERIENCE + EXPERTISE + EXCELLENCE

TE has proven experience and expertise in the design, manufacture and implementation of our Customizable Trunk Solution.

We have made significant investment in building EBoS solution components that meet the most stringent standards of excellence to ensure the long-term durability and reliability of your solar farm installation.

Our customers receive dedicated consultancy and support from our skilled teams of engineers, from design to delivery, and every step in-between.

30+
YEARS ENGINEERING EXPERIENCE

830+
MILLION USD INVESTMENT IN ENGINEERING AND R&D

13
MANUFACTURING SITES OF ENERGY PRODUCTS AROUND THE WORLD

UP TO 30%
MORE TRUNK CABLE CARRYING CAPACITY OVERGROUND VS UNDERGROUND

UP TO 50%
REDUCTION IN INSTALLATION TIME VS TRADITIONAL EBoS

UP TO 40%
SAVINGS IN MATERIAL COSTS VS TRADITIONAL EBoS

IN-HOUSE EXPERTISE
IN LV DC, MV & HV AC, GROUNDING SYSTEMS

100%
SUSTAINABLE PACKAGING

5
YEARS WARRANTY WORLDWIDE

Source: TE internal estimates based on implemented projects and customer inputs.

TE Connectivity plc (NYSE: TEL) is a global industrial technology leader creating a safer, sustainable, productive, and connected future. As a trusted innovation partner, our broad range of connectivity and sensor solutions enable the distribution of power, signal and data to advance next-generation transportation, energy networks, automated factories, data centers enabling artificial intelligence, and more.

Our more than 90,000 employees, including 10,000 engineers, work alongside customers in approximately 130 countries. In a world that is racing ahead, TE ensures that EVERY CONNECTION COUNTS.
Learn more at www.te.com and on LinkedIn, Facebook, WeChat and Instagram.

TE Connectivity
Energy

TE.com/cts

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