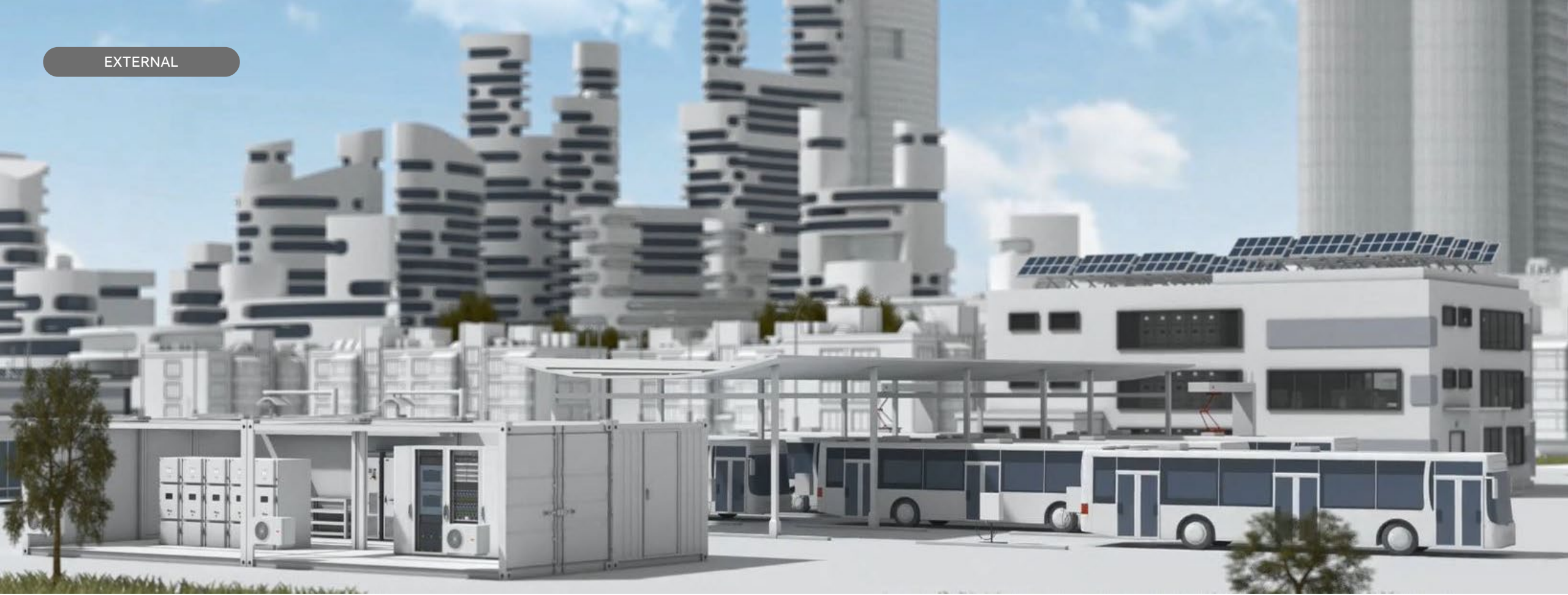


EXTERNAL



ARCHITECTURES FOR E-MOBILITY BUS DEPOT APPLICATIONS

Modular intelligent building blocks save time & optimize energy

2MW Bus depot power and charging blocks (IEC)

EM1- EM-eBus/ eFleet_Bus/Fleet depot_IEC_EcoFlex/ eHouse_2MW_MV



Scalable solution to build scalable depot charging infrastructure

Overview

eFleet depot solution

The combination of ABB's modular blocks provides the solution architecture that meets the demand of modern eBus depots:

- Maximize profitability, with scalable solution for expansion when needed
- Integrated solution with chargers, power and digital comm for monitoring, control and optimization options
- Lower risk, ensure a smooth startup and immediate return on investment with pre-engineered, pre-fabricated and pre-tested solution
- **Stackable modules for space savings**

Solution architecture

ABB's pre-engineered solution architectures meet the scalability and ease of installation requested by depot charging stations

- Pre-engineered solutions provide shorter delivery times and faster return on investment
- Digital packages pre-tested for fast installation and start-up at site
- Integrated load management for optimum charging
- Accommodates up to 8 - 160 kWp chargers per power block
- Design enables simultaneous charging at peak power at 40°C

Example



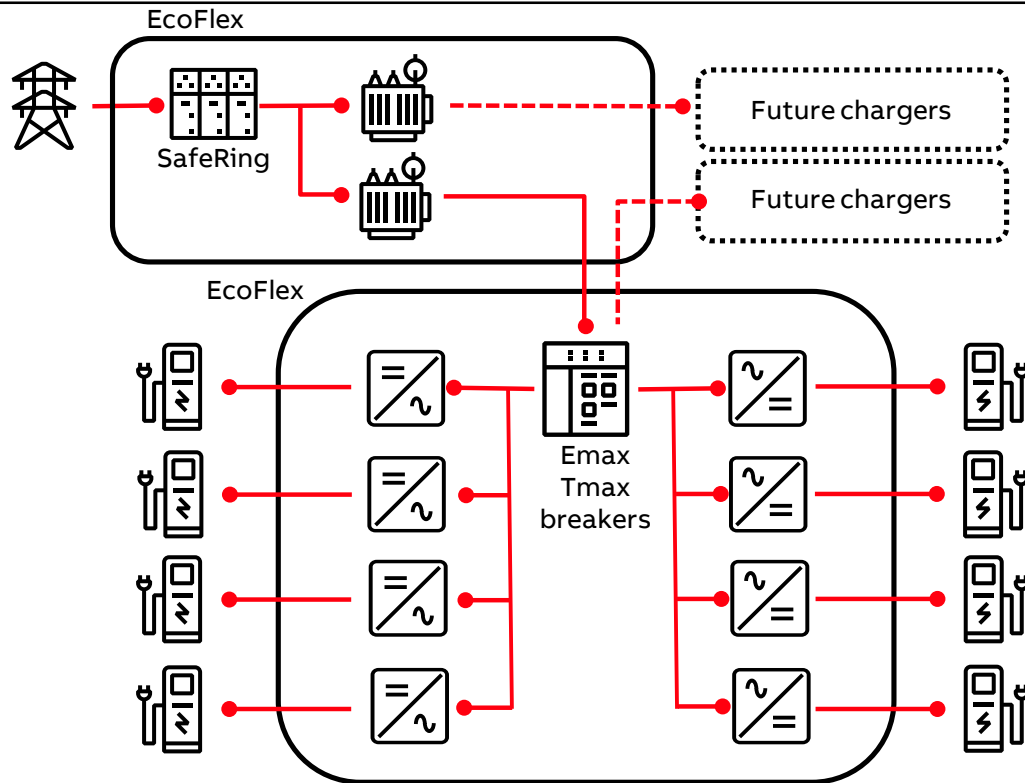
Solving today's e-mobility fleet challenges

Solution advantages

Challenge	Solution	Advantage
Scalability	Modular design	Provides for a scalable solution that can be expanded as capacity changes. Integration of power, control and communication makes expansion quick and easy
Risk	Factory assembled, pre-wired and pre-tested	Assures smooth startup and reduces schedule risk and maximizes reliability
Speed	Plug-and-play solution	Allows for quick connection to the grid – up to 60% faster installation and startup time with minimal site and civil works
Safety	IEC standard electrical equipment	Provides for a scalable solution that can be expanded as capacity changes
Asset and energy monitoring	On-premise and/or cloud	Asset condition monitoring for efficient service and maintenance. Energy management for optimum energy usage and to minimize utility bills

eFleet Depot IEC EcoFlex

Single line diagram



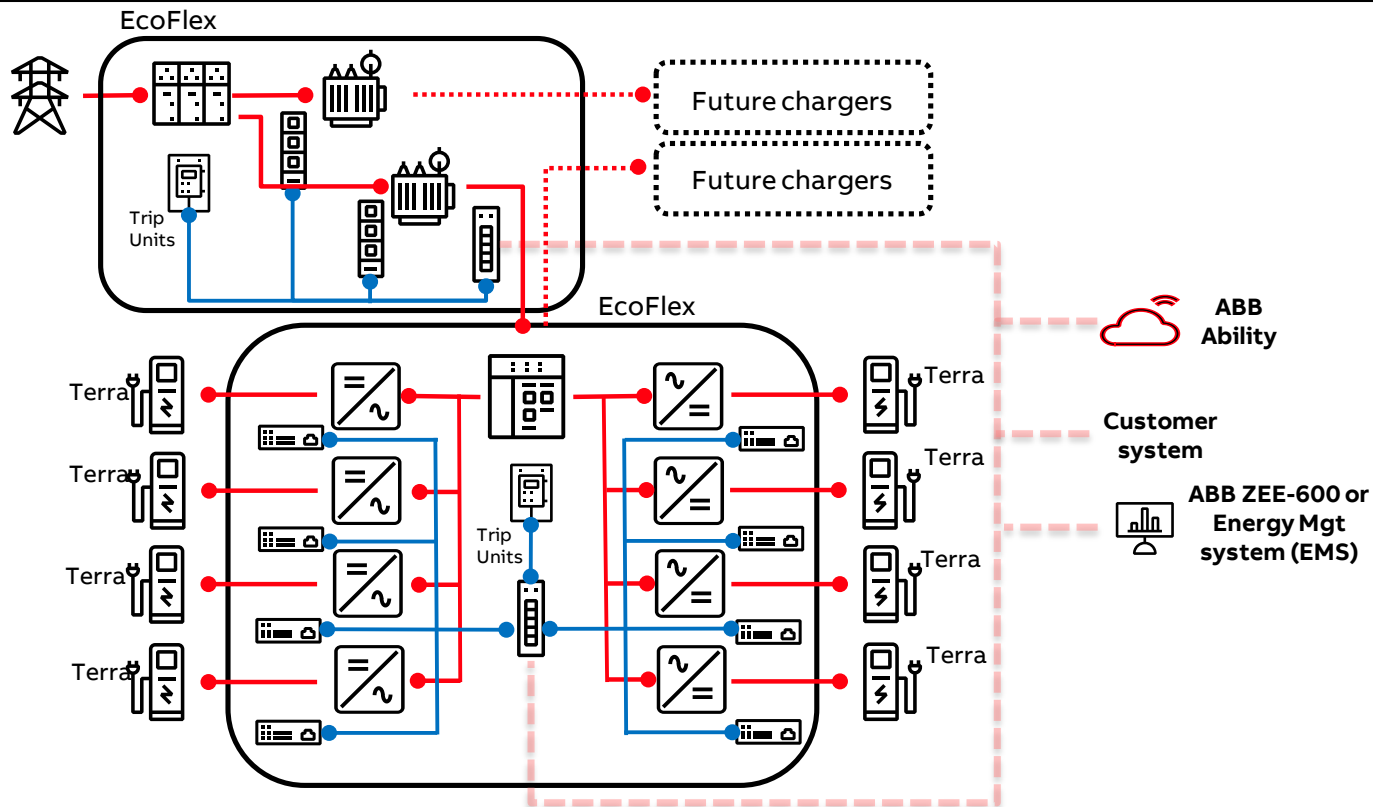
Features of architecture

Scalable architecture of modular blocks enable fast and efficient expansion when needed. Units can be stacked for small footprint.

- ABB SafeRing MV switchgear provide reliable grid connection
- Pre-wired and tested MV module speeds installation
- Pre designed power and control interfaces between LV distribution of Emax 2 & Tmax XT breakers with Ekip trip units and ABB Terra chargers provide fast and reliable start-up
- Flexible site placement due to options for cable entry and no required forced ventilation or air conditioning

eFleet depot IEC modular solution

Digital single line diagram



Features of architecture

- Structured communication interfaces between power modules and chargers make expansion and start-up easy
- MV gear with Relion REF-615 relays provide reliable protection, control and monitoring of MV circuit breakers.
- The Ekip trip units on Emax 2 and Tmax XT breakers provide protection, control and monitoring of the LV equipment and loads.
- Terra EV charging stations communicate with monitoring and billing systems
- Energy management and asset management available for on-premise and/or cloud applications with [ZEE-600](#), [EDCS](#), [CMES](#), [MRC](#).

E-Mobility bus depot solution

The equipment

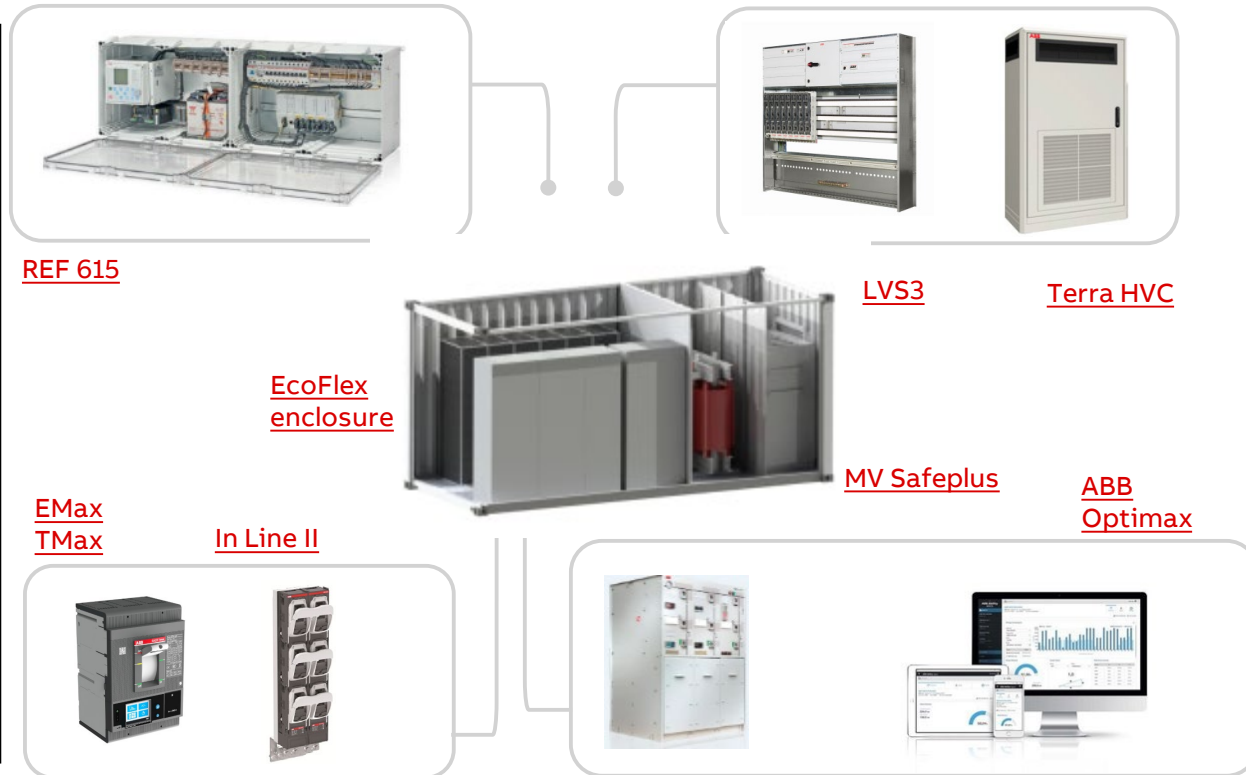
Typical Equipment

- Ecoflex ISO transportable enclosure
- MV SafeRing equipment with Relion REF-615 relays
- Transformer (oil or dry type)
- LVS3 Low voltage switchboard with Emax 2 and Tmax XT circuit breakers with Ekip trip units and/or InLine II fuse disconnectors
- Terra high-power chargers

Optional equipment

- Seismic certifications
- ABB Ability and Energy and asset management options with ZEE-600, Electrical Distribution Control System (EDCS), Condition Monitoring for Electrical Systems (CMES), My Remote Care (MRC)

Typical Equipment



ABB