

CompactDock-R120

OEM Wireless Charging Module for Mobile Robots - Concept Specification

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OEM Wireless Charging Module for Mobile Robots

Concept Product | 24 V / 5 A | 120 W

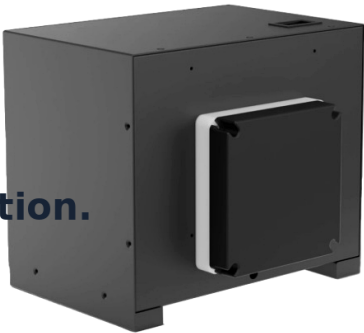
120 W
Continuous output

24 V / 5 A
Nominal charging

DC Input
24-48 V supply

Small footprint. Fast OEM integration.

Side-coupled charging for compact AGVs, AMRs, service robots and mobile test equipment.



CONCEPT SPECIFICATION

120 W	24 V / 5 A	24-48 VDC	CAN + RS-485
Continuous output	Nominal charging	Transmitter input	Communications

Concept targets for development; not verified production ratings.

Product Concept

CompactDock-R120 is a split transmitter-and-receiver wireless charging module for compact AGVs, AMRs and service robots. The small floor or workcell-mounted transmitter operates from an industrial DC bus, while a thin receiver plate is integrated into the vehicle side panel. The system is intended for automatic opportunity charging at repeatable process stops without exposed conductive contacts.

Why the Market Needs It

Smaller robot platforms

Compact carts often need 100-150 W rather than a large kilowatt-class station.

Fast OEM integration

DC input, compact enclosures and standard communications simplify installation in new or existing fleets.

Lower maintenance

Contact-free power avoids spring-pin wear, contamination and alignment damage.

Opportunity charging

Short charging events during loading, queueing and idle periods improve fleet availability.

Shared infrastructure

Programmable charging profiles allow a common transmitter design to serve multiple vehicle types.

Target Electrical Specification

Parameter	Concept target
Transmitter input	24-48 VDC nominal; 20-60 V operating window
Rated output	120 W continuous; 150 W short-duration peak
Vehicle DC output	20-29.4 V programmable; 24 V / 5 A nominal
Charging control	Programmable CC/CV with BMS enable
Battery support	24 V-class Li-ion, LiFePO4 and lead-acid profiles
End-to-end efficiency	Up to 88% at nominal alignment; >=82% within validated window
Standby consumption	<3 W target
Isolation	1.5 kVDC target across the wireless power path
Communication	CAN 2.0B and RS-485 / Modbus RTU
Protection	OVP, UVP, OCP, short circuit, OTP, FOD and communication timeout

Architecture

The transmitter converts the factory DC bus into a controlled high-frequency magnetic field. The vehicle receiver rectifies and regulates the transferred energy into a programmable battery-charging output. A closed-loop link manages output current, alignment status and shutdown.

Target Mechanical & Docking Specification



Parameter	Concept target
Transmitter enclosure	Approx. 180 x 130 x 105 mm
Vehicle receiver pad	Approx. 130 x 105 x 25 mm
Transmitter weight	<=2.5 kg target
Nominal air gap	15 mm
Validated air-gap window	8-30 mm target
Lateral misalignment	+/-20 mm target
Vertical misalignment	+/-12 mm target
Cooling	Passive convection at 120 W
Protection rating	IP54 standard; IP65 option
Operating temperature	-20 to +45 C at full power
Mounting	Floor, wall or machine-frame mounting

Product Advantages

Engineered for Compact Robot Platforms

A modular transmitter and vehicle-side receiver architecture



- **120 W Power Class**

24 V / 5 A nominal output

- **Wide DC Input**

24-48 V industrial bus

- **Passive Cooling**

Low maintenance, silent operation

- **Smart Interface**

CAN 2.0B + RS-485 / Modbus

Target values shown - subject to engineering validation.

Compact two-piece design

The small transmitter and thin receiver fit space-constrained platforms.

Industrial DC-bus input

24-48 VDC input avoids a separate AC power stage inside each charge point.

Passive cooling

Silent operation and fewer wear components reduce maintenance.

Programmable battery output

Software-configurable CC/CV charging supports multiple 24 V-class battery packs.

Fleet-ready data

Voltage, current, temperature, energy and fault status are available to the vehicle controller.

Flexible deployment

Mount at workcells, conveyor stops, parking lanes or service-robot docks.

Applications & Validation

Compact warehouse AGVs

Charge during loading, unloading and queue stops.

Service and cleaning robots

Low-profile docks for unattended daily operation.

Mobile test equipment

Recharge instruments automatically when they return to a station.

Inspection robots

Contact-free charging in dusty or frequently cycled indoor environments.

Custom OEM platforms

Embed the receiver in new vehicle side panels and use a shared DC-powered transmitter.

Development Plan

Phase	Verification focus
EVT	Coil tuning, power conversion, thermal design, communication and FOD
DVT	Docking tolerance map, battery profiles, EMC, ingress and durability
PVT	Production calibration, end-of-line testing and installation repeatability
Release	Regional safety, EMC and environmental compliance

Definition Note

Every electrical, dimensional and environmental value in this document is a proposed engineering target inferred from the supplied concept images and intended market. Final specifications require prototype testing and certification.

Market Benchmark Basis

The 120 W concept is positioned for small and medium robots where compact packaging and configurable battery output matter more than kilowatt-level fast charging. Published 150 W robot chargers demonstrate market demand for wide battery-voltage support, multiple chemistries, CAN communication and compact onboard hardware. CompactDock-R120 adopts those buying requirements while emphasizing a passive-cooled 24 V / 5 A OEM module.

Market signal	Concept response
150 W compact onboard chargers	120 W continuous output with 150 W short-duration peak
10-58.4 V battery support in comparable systems	Configurable 20-29.4 V output optimized for 24 V fleets
CAN-based robot integration	CAN 2.0B plus RS-485 / Modbus
Opportunity-charging fleet operation	Automatic charging at natural process stops
Compact enclosed onboard hardware	Thin receiver plate and small DC-powered transmitter

Reference Sources

WiBotic OC-150: <https://www.wibotic.com/product/oc-150/>

WiBotic hardware product range: <https://www.wibotic.com/products/hardware/>