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MDOBILITY

# **INCH Duo** TECHNICAL DATASHEET

## CHARGER POWER SUPPLY INFORMATION

| | |
|---|---|
| **NOMINAL VOLTAGE** | 90 V AC to 253 V AC supported (single-phase) and up to 440 V AC (three-phase)<br>Charging station can be connected single-phase or three-phase. |
| **NOMINAL CURRENT PER PHASE** | Max 32 A per phase<br>Three phase model 3 x 32 A, single phase model 1 x 32 A. Can be adjusted (low) through charger settings. |
| **MAXIMUM CHARGING POWER** | 7,4 kW (single phase) and 22 kW (three phase)<br>Max power can be adjusted (lowered) when the charging station is installed and later using the power management algorithms and power management settings using the user interface (mobile app, web app). |
| **FREQUENCY** | 47 Hz – 63 Hz |
| **SUPPORTING GROUNDING SYSTEMS** | The charging station must be properly grounded.<br>Following grounding system are supported: TN-S, TN-C, TN-C-S and TT under special conditions. Where this is possible local grounding should be done. 1-phase connection of IT grounding system is supported and 3- phase IT with use of transformer. |
| **STANDBY OWN ENERGY CONSUMPTION** | Own consumption power from 5 W.<br>Depends on actual configuration and integrated modules (Wi-Fi, LTE, payment terminal, etc). |
| **DEVICE OVERVOLTAGE SENSITIVITY** | Category III EN 60664 |

## CHARGER OUTPUT

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|---|---|
| **NUMBER OF CHARGING OUTPUTS (SOCKETS)** | 2 |
| **NOMINAL VOLTAGE (SINGLE-PHASE VEHICLE CONNECTED)** | Power supply voltage 230 V AC (-10 % , +10 %) and 120 V AC (-10 %, +10 %)<br>On-board car charger nominal voltage depends on the car specification and typically reaches values between 100 V DC and 500 V DC. |
| **NOMINAL VOLTAGE (THREE-PHASE VEHICLE CONNECTED)** | Power supply voltage 400 V AC (-10 %, +10 %) and 208 V AC (-10 %, +10 %)<br>On-board car charger nominal voltage depends on the car specification and typically reaches values between 100 V DC and 500 V DC. On a three phase charging station single and three phase vehicles can charge. |
| **NOMINAL CURRENT PER PHASE PER CONNECTOR** | Max 32 A per phase<br>Three phase model 3 x 32 A, single phase model 1 x 32 A. Can be adjusted through charger settings. |
| **MAXIMUM CHARGING POWER PER CONNECTOR** | 7,4 kW (single phase) and 22 kW (three phase)<br>Max. power can be adjusted (lowered) when the charging station is installed and later using the power management algorithms and power management settings using the user interface (mobile app, web app). |
| **CHARGING SOCKET TYPE** | Type 2 socket compliant with IEC 62196-2<br>• Socket without status LED light (default)<br>• Socket with status LED light (optionally)<br>• Socket with shutter (optionally) |

## ELECTRICAL PROTECTION

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|---|---|
| **DIFFERENTIAL PROTECTION** | Residual current device with Δ I = 30 mA. Different options possible:<br>• DC fault current sensor 6 mA, default option.<br>• RCD Type A, RCD Type A EV, RCD Type B, optionally.<br>One protection can be installed inside the charging station. If differential protection is integrated in the charging station then overcurrent protection needs to be installed in the electric cabinet or vice versa. RCBO performs the function of overcurrent and differential protection. When using a RCBO with a rated overcurrent protection below 40 A, it is necessary to limit the maximum charging current to a lower value. Compliant with the following standards:<br>• IEC 61851, IEC 62955, IEC/EN 62423 (Type B). |
| **SURGE AND OVERVOLTAGE PROTECTION (OPTIONAL)** | Installed in external electrical cabinet or in charger. |
| **OVERCURRENT PROTECTION** | MCB between 16 A and 40 A, characteristics C.<br>One protection can be installed inside the charging station. If differential protection is integrated in the charging station then overcurrent protection needs to be installed in the electric cabinet or vice versa. Rated short time withstand current: 6 kA. |
| **ADDITIONAL PROTECTION, CHECKING IF MEASURED CHARGING CURRENT IS HIGHER THAN SET CURRENT** | Software overcurrent protection based on additional internal current measurements.<br>Prevents circuit breaker outage. Stop charging if load (EV) does not follow current's setpoint. |

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# METERING

**MID METER**

Two MID meters are installed inside the charging station.
Accuracy meter rating: Class 1 for active energy according to EN 62053-21 and class B according to EN 50470-3.

**EMBEDDED METER (OPTIONAL)**

Embedded meter accuracy rating: Class 2.

Possible measurements: active and reactive energy and power on all phases, voltage measurements on all phases, current on all phases and energy in both directions, power factor, frequency.
• When MID meter is installed part of embedded meter is removed.

# COMMUNICATION INTERFACES WITH SMART HOME OR CPO BACK-END

**ETHERNET**

Ethernet module

10 Mbps/100 Mbps connection available in the charger service area.

**MOBILE (OPTIONAL)**

LTE module

Modem supports following frequencies:
• GSM | GPRS | EDGE: 850, 900, 1800, 1900.
• UMTS | HSPA; 800/850, 900, AWS 1700, 1900, 2100 MHz.
• Bands B6 and B19 (800 MHz) are a subset of B5 (850 MHz) and are supported as well.
• Installation of LTE module cancels the possibility of the Wi-Fi module.

**WIFI (OPTIONAL)**

Wi-Fi module

Network standard:
• IEEE 802.11n | IEEE 802.11g | IEEE 802.11b
Wireless transmission rate:
• 11n: max 150 Mbps | 11g: max 65 Mbps | 11b: max 11 Mbps Frequency rate:
• 2.4 – 2.4835 G
Wireless security:
• Wireless MAC address filtering.
• Wireless security function switch.
• 64/128/152 bit WEP encryption.
• WPA-PSK/WPA2-PSK, WPA/WPA2 security mechanism.
• Installation of Wi-Fi module cancels the possibility of the LTE module.

**ROUTER (OPTIONAL)**

LTE Router

Mobile: 4G (LTE) – Cat 4 DL up to 150 Mbps, UL up to 50 Mbps; DC-HSPA+; UMTS; TD-SCDMA; EDGE; GPRS
Ethernet: 2 x 10/100 Ethernet ports: 1 x WAN (configurable as LAN), 1 x LAN

**NETWORK SWITCH (OPTIONAL)**

Ethernet switch

Supports straight or cross wired cables.
Operating mode: Store and Forward, L2 wire-speed/non-blocking switching engine.
Speed: 10/100 Mbps.
Protocols: IEEE 802.3 , IEEE 802.3x, Flow Control, Back Pressure, TCP/UDP.

**DIGITAL INPUTS AND OUTPUTS (OPTIONAL)**

Signal 12 V, configurable digital inputs and outputs

# COMMUNICATION INTERFACES WITH ELECTRIC VEHICLES

**IEC 61851**

Digital communication according to IEC 61851-1:2017 is supported.

• Older versions of the standard are also supported.

**IEC 15118**

High-level communication according to ISO 15118:2015 is supported.

• Hardware is already prepared for installation of additional PLC module.

# COMMUNICATION PROTOCOLS

**OCPP**

• OCPP 1.6 SOAP (fully supported).
• OCPP 1.6 JSON (all messages/methods supported).
• OCPP 2.0 JSON (upcoming).
• Additionally: Custom data transfer messages supported (for pricing and on display advertising).
• Allows OCPP communication with multiple nodes.

**CUSTOM WEB API**

We can provide API specification.

• Authorization is supported/required on this interface.

**MODBUS TCP SERVER**

Used for integration with Smart Home/Smart building.

• Modbus registers table can be provided.

# USER INTERFACES

**TRUE COLOR LCD DISPLAY 3.5 INCH WITH TOUCH INTERFACE**

Specifications:

- LCD visual dimensions: 118.5 x 77.6 mm
- Resolution: 800 x 480 pixels
- 5-inch touch display true color (16 MB RGB)
- Sunlight readable, 12 o'clock view angle

**WEB INTERFACE FOR LOCAL USERS AND MAINTENANCE**

Embedded web interface with responsive design (PC, tablet, phone).

It allows charger configuration, online control of charging session, enables reporting, diagnostics/trouble shooting and firmware upgrades.

**STATUS LED**

Is turned on in standby mode to indicate charger present status.

# OTHER USER INTERFACE FUNCTIONALITIES

**HELP EMBEDDED ON SCREEN**

Charging station's LCD provides help tips.

**MULTILINGUAL SUPPORT**

Multiple languages supported.

Configurable through web interface.

**ON SCREEN ADVERTISING (OPTIONAL)**

Advertisement can be shown on the user interface.

**OTHER**

Remote charging start/stop, reservations, configurations, interactive charging levels (user, building, other charging stations, grid), updating, clustering ...

# CHARGER UNLOCKING POSSIBILITIES

**RFID READER**

RFID module specification:

- Supports SPI and UART, 4 GPIO's.
- Integrated antenna, frequency 13.56 MHz.
- Up to 7 cm reading distance.

Supported cards:
- ISO14443A: MIFARE Classic 1k & 4k, MIFARE Classic 1k & 4k EV14), Mini, DESFire EV13), Plus S&X, Pro X, SmartMX, Ultralight, Ultralight EV14), Ultralight C, NTAG2xx4)
- SLE44R35, SLE66Rxx (my-d move), LEGIC Advant1), PayPass2)
- ISO14443B: Calypso2), CEPAS2), Moneo2), PicoPass2), SRI512, SRT512, SRI4K, SRIX4K
- ISO18092 / NFC: NFC Forum Tag Type 1-4
- Sony FeliCa1)

1) UID only, 2) UID only - read/write on request, 3) AES only, 4) read/write enhanced security features planned

**PLUG AND CHARGE**

YES

**OCPP (BACK-END FUNCTIONALITY)**

OCPP, Open Charge Point Protocol enables connections between Mobility Service Provider and Charge Point Operator (if supported by operator):

- Real-time information about location, availability and price.
- A uniform way of exchanging data.
- Roaming system.
- Remote mobile support to access any charge station without pre- registration.
- Communication via mobile application or SMS.

**AUTHORIZATION USING PIN**

Users and PIN's configurable through charger web interface.

# BASIC MECHANICAL SPECIFICATION

**DIMENSIONS (HxWxD)**

134.3 x 31.2 x 20.0 [cm], middle point height of charging sockets is 108 cm.

**WEIGHT**

38 kg (weight depending on the actual configuration).

**DIMENSION INCLUDING PACKAGING (HxWxD)**

Packaging adds 10 cm to all dimensions of the product.

**WEIGHT INCLUDING PACKAGING**

Packaging adds 5 kg to the charging station.

**CASING MATERIAL**

Stainless steel with extra anti-corrosion protection (powder coated) and polycarbonate display cover. UI holder material: fibre-reinforced ABS.

**CASING COLOUR (OPTIONAL)**

Grey and grey.

- Non-default colour combinations available at a surcharge.

# INLET CABLE HANDLING

**POWER CABLE ENTRANCE DIRECTION**

Power cables can be inserted into the station from the back and from bottom of the charging station.

**POWER CABLE DIMENSIONS**

Up to 5 x 50 mm2 cables can be used directly. Customization for every customer 2 needs with additional clamps possible up to 135 mm .

**ETHERNET CABLE ENTRANCE**

Ethernet cables can be inserted into the station from the back and from bottom of the charging station.

**ETHERNET CABLE TYPE**

CAT-5, RJ45 connector. SFTP preferred if layered with power cables or on long distances. CAT-5 cable suggested longest distance without using signal repeaters is 100 m.

# ENVIRONMENTAL SPECIFICATIONS

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|---|---|
| **ENCLOSURE INGRESS PROTECTION** | IP 54<br>in testing with IK10. |
| **TEMPERATURE RANGE** | Operation temperature range: -20°C to +65°C<br>Storage temperature range: -40°C to +70°C<br>Product extendable with thermostat and heater. |
| **HUMIDITY** | Up to 90 % relative humidity, non-condensing |
| **MAXIMUM ALTITUDE** | 2000 m |

# VANDALISM PROTECTION

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|---|---|
| **IMPACT PROTECTION** | IK10 |
| **PLUG LOCKING (OPTIONAL)** | Plug locking operation can be enabled or disabled in charger configuration. |
| **DOOR LOCKING** | Three point door locking with single mechanism. Single key access.<br>Door open sensor. Device tilt sensor. |

# MAINTENANCE

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|---|---|
| **FIRMWARE UPDATE** | Firmware update done through backend system or web interface. |
| **ACCESS TO SERVICE AREA** | Service doors with key. |
| **FUNCTIONS SUPPORTED THROUGH SERVICE AREA** | Access to:<br>• Ethernet<br>• Mobile SIM<br>• Charger system reset<br>• Charger configuration reset<br>• Protection manipulation<br>• RCD protection test button<br>• Connection to the power supply<br>• Configurable digital inputs (DI) and digital outputs (DO) |
| **CLEANING** | • Cloth and water or water-based or alcohol-based cleaners.<br>• Do not use solvent-based cleaners. |

# POWER MANAGEMENT

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|---|---|
| **ECONOMIC/PRICE OPTIMIZATION** | • Based on energy tariffs.<br>• Time scheduling of charging towards lower tariffs or self-consumption when user preferences and pricing allows it.<br>• Evaluation of on-site production (e.g., photovoltaics). |
| **OPERATION OPTIMIZATION** | • Machine learning and pattern recognition using built-in AI to predict and optimise each charging session.<br>• Collection of user's departure time over app or touch screen to refine automatically suggested charging profile.<br>• Support for Modbus protocol for integration with external smart building systems. |
| **PREVENT OVERLOADING MAIN FUSE – GRID CONNECTION POINT** | By using Load Guard device:<br>• Static limit of maximum allowed charging current per phase.<br>• Static limit of maximum allowed charging current per phase in case connection with Load Guard sensor / back- end is lost.<br>• Detection and visualisation of available supply and automatic adjustment of charging power.<br>• Detection and visualisation of surplus energy returned to the grid (Production from renewable energy sources). |
| **DEMAND RESPONSE ACTIVATION (BACK-END FUNCTIONALITY)** | • Remote power manipulation by DSO.<br>• Remote power manipulation by energy supplier. |
| **MANAGING CLUSTER OF CHARGERS** | • Based on user preferences and current installation's load conditions.<br>• Master-slave relationship with floating master.<br>Connection of two chargers possible.<br>• Larger cluster (supply of up to 50 electric vehicles) is possible with use of industrial computer and connection to management software. |