ETREL

TECHNICAL DATASHEET

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MODEL: ***Etrel INCH Pro***

Electrical specification

CHARGER POWER SUPPLY INFORMATION

NOMINAL VOLTAGE	90 V AC to 253 V AC supported (single-phase) and up to 440 V AC (three-phase) Charging station can be connected single-phase or three-phase, depending on the configuration. Prior to installation please confirm that your charger model supports the desired connection option.
NOMINAL CURRENT PER PHASE	Max 32 A per phase Three phase model 3 x 32 A, single phase model 1 x 32 A. Can be adjusted (lowered) through charger settings.
MAXIMUM CHARGING POWER	7,4 kW (single phase) and 22 kW (three phase) 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
SUPPORTED GROUNDING SYSTEMS	The charging station must be properly grounded. 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 2 W up to 15 W. Depends on actual configuration and integrated modules (GPRS, Wi-Fi, PLC, …).
DEVICE OVERVOLTAGE SENSITIVITY	Category III EN 60664

CHARGER OUTPUT

NUMBER OF CHARGING OUTPUTS (SOCKETS)	1
NOMINAL VOLTAGE (SINGLE-PHASE VEHICLE CONNECTED)	Power supply voltage 230 V AC (-10 % , +10 %) and 120 V AC (-10 %, +10 %) 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 %) 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	Max 32 A per phase Three phase model 3 x 32 A, single phase model 1 x 32 A. Can be adjusted through charger settings.
MAXIMUM CHARGING POWER	7,4 kW (single phase) and 22 kW (three phase) 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
CHARGING CABLE TYPE (ALTERNATIVE)	With Type 2 connector supporting IEC 62196-2 type plug.

ELECTRICAL PROTECTION

DIFFERENTIAL PROTECTION	Residual current device with Δ I = 30 mA. Different options possible: • DC fault current sensor 6 mA, default option. • RCD Type A, RCD Type A EV, RCD Type B, RCBO, optionally. 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: • IEC 61851, IEC 62955, IEC/EN 62423 (Type B).	●
SURGE AND OVERVOLTAGE PROTECTION	Should be installed in external electrical cabinet.	N/A
OVERCURRENT PROTECTION	MCB between 16 A and 40 A, characteristics C. 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. Prevents circuit breaker outage. Stop charging if load (EV) does not follow current's setpoint.	●

METERING

MID METER	MID meter can be 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. When MID meter is installed inside the charging station all protection devices need to be installed in the el. cabinet. This guarantees sufficient protection of household loads, EV and user during charging.	Optional
EMBEDDED METER	Embedded meter accuracy rating: 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 WITH SMART HOME OR CENTRAL BACK-END

ETHERNET	Ethernet module 10 Mbps/100 Mbps connection available in the charger service area.	●
MOBILE	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.	Optional
WIFI	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.	

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.

COMMUNICATION PROTOCOLS

OCPP	• OCPP 1.6 SOAP (fully supported). • OCPP 1.6 JSON (all messages /methods supported). • OCPP 2.0 JSON (upcomming). • 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

COLOR LCD DISPLAY 3.5 INCH WITH TOUCH INTERFACE	Specification: • Size: 3.5 inches (320 x 240 pixels). • Brightness: 650 cd/m^2. • View angle: 12 o'clock. • Capacitive touch behind vandal proof cover glass.	●
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	Advertisement can be shown on the user interface.	Optional
OTHER	Remote charging start/stop, reservations, configurations, interactive charging levels (user, building, other charging stations, grid), updating, clustering …	

Mechanical specification

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 EV1[4], Mini, DESFire EV1[3], Plus S&X, Pro X, SmartMX, Ultralight, Ultralight EV1[4], Ultralight C, NTAG2xx[4] - SLE44R35, SLE66Rxx (my-d move), LEGIC Advant[1], PayPass[2] - ISO14443B: Calypso[2], CEPAS[2], Moneo[2], PicoPass[2], SRI512, SRT512, SRI4K, SRIX4K - ISO18092 / NFC: NFC Forum Tag Type 1-4 - Sony FeliCa[1] 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.	Optional
AUTHORIZATION USING PIN	Users and PIN's configurable through charger web interface.	Optional

BASIC MECHANICAL SPECIFICATION

DIMENSIONS (HXWXD)	45 x 27 x 13.5 [cm] (model with socket) 45 x 27 x 13.5 [cm] (model with cable holder) • The cable dimensions are not included in the specified dimensions of the product. Approximate height of the tidied up cable on holder is 0.5 m.	
WEIGHT	8.2 [kg] (model with socket), including packaging 9.5 [kg] 11.1 [kg] (model with 5 m cable), including packaging 12.7 [kg] 12.3 [kg] (model with 7 m cable), including packaging 13.9 [kg]	
DIMENSION INCLUDING PACKAGING (HXWXD)	60 x 40 x 18 [cm] (model with socket) 60 x 40 x 25 [cm] (model with cable)	
CASING MATERIAL	Aluminium, cover plate Polycarbonate Lexan.	
CASING COLOR	White or anthracite grey.	Optional
MOUNTING OPTIONS	Wall mounted: • With back-plate for wall mounting. Self-standing with use of additional pole: • With pole and accessories for mounting of one charger. • With pole and accessories for mounting of two chargers.	Optional

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. Alternately, with the special wall mounting frame also from the top side.
POWER CABLE DIMENSIONS	From 3 x 2,5 mm^2, to 5 x 10 mm^2 • In special condition also 5 x 16 mm^2 cable can be used. • The use of fine-wire cables of appropriate diameter is recommended. Solid-wire cables are also suitable.
ETHERNET CABLE ENTRANCE	Ethernet cables can be inserted into the station from the back and from bottom of the charging station. Alternately, with the special wall mounting frame also from the top side.
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.

CHARGING CABLE HANDLING

CABLE TYPE	Straight cable	●
CABLE LENGTH	Multiple lengths supported: 5 m (default) or 7 m (optional).	●
CABLE HOLDER	Cable holder for charging station with embedded cable.	●
PLUG HOLDER	Magnetic holder	●

Software solutions

ENVIRONMENTAL SPECIFICATIONS		
INGRESS PROTECTION	IP 56 in testing with IK10. The cable plug could have lower IP.	●
TEMPERATURE RANGE	Operation temperature range: -25°C to +65°C Storage temperature range: -40°C to +70°C	●
HUMIDITY	Up to 95 % relative humidity, non-condensing	●
MAXIMUM ALTITUDE	2000 m	●
VANDALISM PROTECTION		
IMPACT PROTECTION	IK10	●
PLUG LOCKING	Plug locking operation can be enabled or disabled in charger configuration.	Optional
MAINTENANCE		
FIRMWARE UPDATE	Firmware update done through backend system or web interface.	●
ACCESS TO SERVICE AREA	Service doors with key, or service doors with MID window and key.	●
FUNCTIONS SUPPORTED THROUGH SERVICE AREA	Access to: • Ethernet • Mobile SIM • Charger system reset • Charger configuration reset • Protection manipulation • RCD protection test button	●
CLEANING	• Cloth and water or water-based or alcohol-based cleaners. • Do not use solvent-based cleaners.	●
POWER MANAGEMENT		
ECONOMIC/PRICE OPTIMIZATION	• Based on energy tariffs. • Time scheduling of charging towards lower tariffs or self-consumption when user preferences and pricing allows it. • 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. • Collection of user's departure time over app or touch screen to refine automatically suggested charging profile. • Support for Modbus protocol for integration with external smart building systems.	●
PREVENT OVERLOADING MAIN FUSE – GRID CONNECTION POINT	By using Load Guard device: • Static limit of maximum allowed charging current per phase. • Static limit of maximum allowed charging current per phase in case connection with Load Guard sensor / back-end is lost. • Detection and visualisation of available supply and automatic adjustment of charging power. • 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. • Remote power manipulation by energy supplier.	●
MANAGING CLUSTER OF CHARGERS	• Based on user preferences and current installation's load conditions. • Master-slave relationship with floating master. Power management of up to 36 electric vehicles is possible. Valid for the most unfavourable scenario with low power capacity available, meaning constant need for power management recalculations with inclusion of data obtained from Load Guard. INCH Pro could also control larger clusters, depending on the individual case. • Larger cluster (supply of up to 300 electric vehicles in most unfavourable scenario) is possible with use of industrial computer and connection to Etrel Ocean management software.	●