

MODEL: *EtreI INCH Pro*

### 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.<br>Can be adjusted (lowered) 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  |
| SUPPORTED 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 2 W up to 15 W.<br>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 %)<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                        | Max 32 A per phase<br>Three phase model 3 x 32 A, single phase model 1 x 32 A.<br>Can be adjusted 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).                                    |
| CHARGING SOCKET TYPE                             | Type 2 socket<br>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 $\Delta I = 30 \text{ mA}$ .<br>Different options possible:<br>• DC fault current sensor 6 mA, default option.<br>• RCD Type A, RCD Type A EV, RCD Type B, RCBO, 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  | Should be installed in external electrical cabinet.  | N/A |
| 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.<br>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.  | ●   |

Electrical specification

| METERING   |   |          |
|--|---|----------|
| <b>MID METER</b>                                       | <p>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.</p> <p>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.</p>   | Optional |
| <b>EMBEDDED METER</b>                                  | <p>Embedded meter accuracy rating: Class 2.</p> <p>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.</p> <ul style="list-style-type: none"> <li>When MID meter is installed part of embedded meter is removed.</li> </ul>  | ●        |
| COMMUNICATION WITH SMART HOME OR CENTRAL BACK-END      |   |          |
| <b>ETHERNET</b>  | <p>Ethernet module</p> <p>10 Mbps/100 Mbps connection available in the charger service area.</p>  | ●        |
| <b>MOBILE</b>  | <p>LTE module</p> <p>Modem supports following frequencies:</p> <ul style="list-style-type: none"> <li>GSM   GPRS   EDGE: 850, 900, 1800, 1900.</li> <li>UMTS   HSPA; 800/850, 900, AWS 1700, 1900, 2100 MHz.</li> <li>Bands B6 and B19 (800 MHz) are a subset of B5 (850 MHz) and are supported as well.</li> <li>Installation of LTE module cancels the possibility of the Wi-Fi module.</li> </ul>  | Optional |
| <b>WIFI</b>  | <p>Wi-Fi module</p> <p>Network standard:</p> <ul style="list-style-type: none"> <li>IEEE 802.11n   IEEE 802.11g   IEEE 802.11b</li> </ul> <p>Wireless transmission rate:</p> <ul style="list-style-type: none"> <li>11n: max 150 Mbps   11g: max 65 Mbps   11b: max 11 Mbps</li> </ul> <p>Frequency rate:</p> <ul style="list-style-type: none"> <li>2.4 – 2.4835 G</li> </ul> <p>Wireless security:</p> <ul style="list-style-type: none"> <li>Wireless MAC address filtering.</li> <li>Wireless security function switch.</li> <li>64/128/152 bit WEP encryption.</li> <li>WPA-PSK/WPA2-PSK, WPA/WPA2 security mechanism.</li> <li>Installation of Wi-Fi module cancels the possibility of the LTE module.</li> </ul> |          |
| COMMUNICATION INTERFACES WITH ELECTRIC VEHICLES        |   |          |
| <b>IEC 61851</b>                                       | <p>Digital communication according to IEC 61851-1:2017 is supported.</p> <ul style="list-style-type: none"> <li>Older versions of the standard are also supported.</li> </ul>   |          |
| <b>IEC 15118</b>                                       | <p>High-level communication according to ISO 15118:2015 is supported.</p> <ul style="list-style-type: none"> <li>Hardware is already prepared for installation of additional PLC module.</li> </ul>   | ●        |
| COMMUNICATION PROTOCOLS                                |   |          |
| <b>OCP</b>   | <ul style="list-style-type: none"> <li>OCP 1.6 SOAP (fully supported).</li> <li>OCP 1.6 JSON (all messages /methods supported).</li> <li>OCP 2.0 JSON (upcoming).</li> <li>Additionally: Custom data transfer messages supported (for pricing and on display advertising).</li> <li>Allows OCP communication with multiple nodes.</li> </ul>  |          |
| <b>CUSTOM WEB API</b>                                  | <p>We can provide API specification.</p> <ul style="list-style-type: none"> <li>Authorization is supported/required on this interface.</li> </ul>   |          |
| <b>MODBUS TCP SERVER</b>                               | <p>Used for integration with Smart Home/Smart building.</p> <ul style="list-style-type: none"> <li>Modbus registers table can be provided.</li> </ul>   |          |
| USER INTERFACES  |   |          |
| <b>COLOR LCD DISPLAY 3.5 INCH WITH TOUCH INTERFACE</b> | <p>Specification:</p> <ul style="list-style-type: none"> <li>Size: 3.5 inches (320 x 240 pixels).</li> <li>Brightness: 650 cd/m<sup>2</sup>.</li> <li>View angle: 12 o'clock.</li> <li>Capacitive touch behind vandal proof cover glass.</li> </ul>   | ●        |
| <b>WEB INTERFACE FOR LOCAL USERS AND MAINTENANCE</b>   | <p>Embedded web interface with responsive design (PC, tablet, phone).</p> <p>It allows charger configuration, online control of charging session, enables reporting, diagnostics/trouble shooting and firmware upgrades.</p>  | ●        |
| <b>STATUS LED</b>                                      | <p>Is turned on in standby mode to indicate charger present status.</p>   | ●        |
| OTHER USER INTERFACE FUNCTIONALITIES                   |   |          |
| <b>HELP EMBEDDED ON SCREEN</b>                         | <p>Charging station's LCD provides help tips.</p>   | ●        |
| <b>MULTILINGUAL SUPPORT</b>                            | <p>Multiple languages supported.</p> <p>Configurable through web interface.</p>   | ●        |
| <b>ON SCREEN ADVERTISING</b>                           | <p>Advertisement can be shown on the user interface.</p>  | Optional |
| <b>OTHER</b>   | <p>Remote charging start/stop, reservations, configurations, interactive charging levels (user, building, other charging stations, grid), updating, clustering ...</p>  |          |

## CHARGER UNLOCKING POSSIBILITIES

|                                      |   |          |
|--------------------------------------|---|----------|
| <b>RFID READER</b>                   | <p>RFID module specification:</p> <ul style="list-style-type: none"> <li>• Supports SPI and UART, 4 GPIO's.</li> <li>• Integrated antenna, frequency 13.56 MHz.</li> <li>• Up to 7 cm reading distance.</li> </ul> <p>Supported cards:</p> <ul style="list-style-type: none"> <li>- ISO14443A: MIFARE Classic 1k &amp; 4k, MIFARE Classic 1k &amp; 4k EV1<sup>4)</sup>, Mini, DESFire EV1<sup>3)</sup>, Plus S&amp;X, Pro X, SmartMX, Ultralight, Ultralight EV1<sup>4)</sup>, Ultralight C, NTAG2xx<sup>4)</sup></li> <li>- SLE44R35, SLE66Rxx (my-d move), LEGIC Advant<sup>1)</sup>, PayPass<sup>2)</sup></li> <li>- ISO14443B: Calypso<sup>2)</sup>, CEPAS<sup>2)</sup>, Moneo<sup>2)</sup>, PicoPass<sup>2)</sup>, SRI512, SRT512, SRI4K, SRIX4K</li> <li>- ISO18092 / NFC: NFC Forum Tag Type 1-4</li> <li>- Sony FeliCa<sup>1)</sup></li> </ul> <p>1) UID only, 2) UID only - read/write on request, 3) AES only, 4) read/write enhanced security features planned</p> | ●        |
| <b>PLUG AND CHARGE</b>               | YES   | ●        |
| <b>OCPP (BACK-END FUNCTIONALITY)</b> | <p>OCPP, Open Charge Point Protocol enables connections between Mobility Service Provider and Charge Point Operator (if supported by operator):</p> <ul style="list-style-type: none"> <li>• Real-time information about location, availability and price.</li> <li>• A uniform way of exchanging data.</li> <li>• Roaming system.</li> <li>• Remote mobile support to access any charge station without pre-registration.</li> <li>• Communication via mobile application or SMS.</li> </ul>   | Optional |
| <b>AUTHORIZATION USING PIN</b>       | Users and PIN's configurable through charger web interface.   | Optional |

## BASIC MECHANICAL SPECIFICATION

|  |   |          |
|--|---|----------|
| <b>DIMENSIONS (HXWXD)</b>                    | <p>45 x 27 x 13.5 [cm] (model with socket)<br/>         45 x 27 x 13.5 [cm] (model with cable holder)<br/>         45 x 27 x 17.5 [cm] (model with shutter)</p> <p>• 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.</p>                    |          |
| <b>WEIGHT</b>                                | <p>8.2 [kg] (model with socket), including packaging 9.5 [kg]<br/>         11.1 [kg] (model with 5 m cable), including packaging 12.7 [kg]<br/>         12.3 [kg] (model with 7 m cable), including packaging 13.9 [kg]</p>   |          |
| <b>DIMENSION INCLUDING PACKAGING (HXWXD)</b> | <p>60 x 40 x 18 [cm] (model with socket)<br/>         60 x 40 x 25 [cm] (model with cable)</p>  |          |
| <b>CASING MATERIAL</b>                       | Aluminium, cover plate Polycarbonate Lexan.   |          |
| <b>CASING COLOR</b>                          | White or anthracite grey.   | Optional |
| <b>MOUNTING OPTIONS</b>                      | <p>Wall mounted:</p> <ul style="list-style-type: none"> <li>• With back-plate for wall mounting.</li> </ul> <p>Self-standing with use of additional pole:</p> <ul style="list-style-type: none"> <li>• With pole and accessories for mounting of one charger.</li> <li>• With pole and accessories for mounting of two chargers.</li> </ul> | Optional |

## INLET CABLE HANDLING

|                                       |   |
|---------------------------------------|---|
| <b>POWER CABLE ENTRANCE DIRECTION</b> | 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.  |
| <b>POWER CABLE DIMENSIONS</b>         | <p>From 3 x 2,5 mm<sup>2</sup>, to 5 x 10 mm<sup>2</sup></p> <ul style="list-style-type: none"> <li>• In special condition also 5 x 16 mm<sup>2</sup> cable can be used.</li> <li>• The use of fine-wire cables of appropriate diameter is recommended. Solid-wire cables are also suitable.</li> </ul> |
| <b>ETHERNET CABLE ENTRANCE</b>        | 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.   |
| <b>ETHERNET CABLE TYPE</b>            | 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

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

| ENVIRONMENTAL SPECIFICATIONS                          |   |          |
|---|---|----------|
| INGRESS PROTECTION                                    | IP 56<br>in testing with IK10. The cable plug could have lower IP.  | ●        |
| TEMPERATURE RANGE                                     | Operation temperature range: -25°C to +65°C<br>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: <ul style="list-style-type: none"> <li>• Ethernet</li> <li>• Mobile SIM</li> <li>• Charger system reset</li> <li>• Charger configuration reset</li> <li>• Protection manipulation</li> <li>• RCD protection test button</li> </ul>   | ●        |
| CLEANING  | <ul style="list-style-type: none"> <li>• Cloth and water or water-based or alcohol-based cleaners.</li> <li>• Do not use solvent-based cleaners.</li> </ul>   | ●        |
| POWER MANAGEMENT                                      |   |          |
| ECONOMIC/PRICE OPTIMIZATION                           | <ul style="list-style-type: none"> <li>• Based on energy tariffs.</li> <li>• Time scheduling of charging towards lower tariffs or self-consumption when user preferences and pricing allows it.</li> <li>• Evaluation of on-site production (e.g., photovoltaics).</li> </ul>   | ●        |
| OPERATION OPTIMIZATION                                | <ul style="list-style-type: none"> <li>• Machine learning and pattern recognition using built-in AI to predict and optimise each charging session.</li> <li>• Collection of user's departure time over app or touch screen to refine automatically suggested charging profile.</li> <li>• Support for Modbus protocol for integration with external smart building systems.</li> </ul>  | ●        |
| PREVENT OVERLOADING MAIN FUSE – GRID CONNECTION POINT | By using Load Guard device: <ul style="list-style-type: none"> <li>• Static limit of maximum allowed charging current per phase.</li> <li>• Static limit of maximum allowed charging current per phase in case connection with Load Guard sensor / back-end is lost.</li> <li>• Detection and visualisation of available supply and automatic adjustment of charging power.</li> <li>• Detection and visualisation of surplus energy returned to the grid (Production from renewable energy sources).</li> </ul>  | ●        |
| DEMAND RESPONSE ACTIVATION (BACK-END FUNCTIONALITY)   | <ul style="list-style-type: none"> <li>• Remote power manipulation by DSO.</li> <li>• Remote power manipulation by energy supplier.</li> </ul>  | ●        |
| MANAGING CLUSTER OF CHARGERS                          | <ul style="list-style-type: none"> <li>• Based on user preferences and current installation's load conditions.</li> <li>• 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.</li> <li>• Larger cluster (supply of up to 300 electric vehicles in most unfavourable scenario) is possible with use of industrial computer and connection to Etrei Ocean management software.</li> </ul> | ●        |