

LOXONE WALLBOX

Technical File

The Electric Vehicles (Smart Charge Points) Regulations 2021



	3
	3
Description of the smart charge point	4
Operating manual	5
Technical solutions implemented to meet the requirements of the Regulations	6
Smart functionality	6
	6
Electricity supplier interoperability	7
	7
Loss of communications network access	7
	7
Safety	7
	8
Measuring system	8
	9
Off-peak charging	9
	9
Randomised delay	9
	10
Security	10
Version History	14

This document is the technical file for the following charge point:

Charge point make:	Loxone
Charge point model:	Wallbox 11kW 16A Tree (Item No.: 100526) Wallbox 11kW 16A Air (Item No.: 100527) Wallbox 7.4kW 32A Tree (Item No.: 100535) Wallbox 7.4kW 32A Air (Item No.: 100536)
Software version at point of sale:	Latest firmware at point of manufacture
Seller: <i>Person responsible for compliance with the Regulations</i>	Loxone UK Ltd, Station Road, Theale, Reading, RG7 4RA Loxone Electronics GmbH, 1 Smart Home, Kollerschlag, Upper Austria, 4154
Manufacturer(s): <i>If different to seller</i>	Loxone 1 Smart Home, Kollerschlag, Upper Austria, 4154
Last update to technical file:	12.6.2023

Description of the smart charge point

This page outlines the general description of the charge point, including a description of its design manufacture, and operation.

The Loxone Wallbox is a charging station for electric vehicles designed for charging mode 3 with connection case C. The charging station must always be used with a Loxone Miniserver to be able to work and use the full range of functions.

There are 4 different product variants, which differ in the power class and the interface to the Miniserver.

Model No.	Power Rating	Interface to Miniserver
Loxone Wallbox 11kW 16A Tree 100526	11kW - 3 Phase	Tree - wired
Loxone Wallbox 11kW 16A Air 100527	11kW - 3 Phase	Air - radio
Loxone Wallbox 7.4kW 32A Tree 100535	7.4kW - 1 Phase	Tree - wired
Loxone Wallbox 7.4kW 32A Air 100536	7.4kW - 1 Phase	Air - radio

The Loxone charging stations are designed for residential use as well as for commercial use according to the product standard IEC 61851-1:2019.

With the Loxone Miniserver, the charging station is fully integrated via the Tree or Air interface and thus offers a variety of possibilities to implement energy management and smart control functionalities. With the different control elements in the Loxone portfolio (Touch Pure, NFC Code Touch, Touch Pure Flex) the charging station can be extended to perfectly cover the individual needs of the customers.

For more details about each model, you can find the datasheets and product descriptions on the webshop page for each model:

<https://shop.loxone.com/enuk/wallbox-tree-16a.html>

<https://shop.loxone.com/enuk/wallbox-air-16a.html>

<https://shop.loxone.com/enuk/wallbox-tree.html>

<https://shop.loxone.com/enuk/wallbox-air.html>

Operating manual

Copy of operating manual as available at point of sale can be found (cross as appropriate):		Attached to this document (hard copy)
		Attached to this document as a digital file (soft copy)
	X	Available online via hyperlink (soft copy)
Link if available online:	https://www.loxone.com/enen/kb/wallbox-tree/	
Version of file received at point of sale if available online:	V1.0	

Technical solutions implemented to meet the requirements of the Regulations

Smart functionality

Requirement	Technical solution adopted to meet the requirement
<p>Charge point is able to send and receive information via a communications network</p>	<p>Due to the connection to a Miniserver, the charging stations can be controlled accordingly.</p> <p>Depending on the selected model, the connection to the Miniserver takes place via the Loxone Tree (wired) or via Loxone Air (radio) interface.</p> <p>The data flow is always bidirectional, which allows to send control commands as well as to receive status information.</p> <p>The Miniserver can be connected to the Internet via Ethernet. This also provides all the information and control possibilities remotely from the app.</p>
<p>Charge point is able to respond to signals or other information received by it by:</p> <ul style="list-style-type: none"> ● Increasing or decreasing the rate of electricity flowing through the charge point ● Changing the time at which electricity flows through the charge point 	<p>The integration into the Miniserver makes sure that the charging station can be controlled as desired, e.g.</p> <ul style="list-style-type: none"> ● Power regulation, in order to be able to use the available solar power optimally. ● Power reduction so as not to overload the grid. ● Charging enabling, in order to allow charging at specific time slots only.
<p>Charge point is capable of using this functionality to provide demand side response services, including response DSR services</p>	<p>If the Miniserver is connected to the internet, there are several possibilities to respond to external commands and to control the charging station.</p>
<p>Charge point has at least one user interface, incorporated in the charge point or otherwise made available to the owner</p>	<p>The status LEDs always give the customer a feedback in which operational mode the charging station is in.</p> <p>A detailed visualization of the status information as well as the control is provided by the Loxone app, which can be configured as desired. Optionally, the user can interact with the charging station using a Touch Pure, NFC Code Touch or Touch Pure Flex.</p>

Electricity supplier interoperability

Requirement	Technical solution adopted to meet the requirement
Charge point is configured such that it will not cease to have smart functionality if the owner changes their electricity supplier	<p>Loxone charging stations can be used independently of the energy supplier.</p> <p>The tariff settings can be adjusted at any time to be able to calculate the costs correctly.</p>

Loss of communications network access

Requirement	Technical solution adopted to meet the requirement
Charge point is configured such that, in the event it ceases to be connected to a communications network, it will remain capable of charging an electric vehicle	<p>The charging station offers a setting option in case of loss of connection. Depending on the application, charging can be prevented or a user-defined charging power can be predefined.</p> <p>As soon as the connection to the Miniserver is re-established, the charging station responds to the commands.</p> <p>The owner will be informed by a notification via the Loxone app in case of a communication loss.</p> <p>In the event of a loss of communication between the Miniserver and the Internet, the charging station can continue to operate in the local network as usual. But external commands can not be handled.</p>

Safety

Requirement	Technical solution adopted to meet the requirement
<p>Charge point is configured such that it will not allow a relevant person to carry out a specified operation where to do so would or may result in a risk to the health or safety of persons.</p> <p>“Relevant persons” means the owner, or an end-user of the relevant charge point who is not the owner.</p> <p>“Specified operation” means:</p> <ul style="list-style-type: none"> • Overriding the default mode of charging during the default charging hours • Overriding the provision of demand side response services • Overriding the random delay 	<p>Loxone charging stations are designed and manufactured to ensure physical safety of all users.</p> <p>It is CE marked to certify it complies with the relevant standards for EV charging equipment.</p> <p>In addition, we recommend that the chargers should only be installed by persons who are qualified to install such equipment, and who have completed the Loxone Partner related training.</p> <p>There are no buttons or switches on the Loxone charging stations for physical interaction. Once the charger is connected to the vehicle, management of the charging session is via the Miniserver.</p> <p>When the charge point detects a fault, it will enter the fault mode. The LED light on the front of the charge point will be red, and the fault information will be reported to the Miniserver. If a fault occurs during the charging process, the charge point will automatically</p>

	<p>stop charging. After the fault is eliminated, the user can unplug or restart the charge point to resume. But before the fault is eliminated, the user cannot start charging by any means.</p> <p>Overriding the default mode of charging during the default charging hours, or overriding the provision of demand response services, or overriding the random delay can only safely be performed through Loxone Config.</p>
--	--

Measuring system

Requirement	Technical solution adopted to meet the requirement
<p>On each occasion it is used, the charge point measures or calculates:</p> <ul style="list-style-type: none"> • The electricity it has imported or exported (in watt-hours or kilowatt-hours) • The amount of time for which it is importing or exporting electricity 	<p>With an additional Modbus energy meter, which must be integrated into the charging station, the device cyclically sends the meter readings to the Miniserver.</p> <p>The charged energy as well as the duration of the charging process is recorded and stored on the Miniserver.</p> <p>This can also be configured to be displayed to the user within the Loxone app interface with the option of a history log and statistics.</p>
<p>The charge point is configured such that the owner can view the information in reference to:</p> <ul style="list-style-type: none"> • Any occasion on which it was used to import or export electricity within the past 12 months • Any month within the past 12 months • The entirety of the last 12-month period 	<p>All these requirements are met by the "Wallbox" function block in the Miniserver.</p> <p>Each charging process is permanently stored with a timestamp, the charged energy, as well as the duration. The last 100 charging cycles can be easily viewed via the app, while all charging processes are stored in the local log files on the Miniserver and can be accessed by the owner.</p> <p>The energy flow of the charging station can always be viewed via the app over previous days, months and years.</p>
<p>The charge point is configured such that it can:</p> <ul style="list-style-type: none"> • On each occasion it is used, measure or calculate every one second the electrical power it has imported or exported (in watts or kilowatts) • Provide this information via a communications network 	<p>This data is measured by the Modbus energy meter in real time, and is then sent to the Miniserver via the Modbus protocol built in to the charging station at an interval no less than every 5 seconds and only if the data has changed, so that the communication transfer is not unnecessarily loaded.</p>
<p>The charge point is configured such that:</p>	<p>The energy meters proposed for use in the charging station have the following specifications and fulfill the Measuring Instrument Regulations:</p> <ul style="list-style-type: none"> • Accuracy class B according to EN50470-1/3

<ul style="list-style-type: none"> • The figures measured or calculated are accurate to within 10% of the actual figure • Any inaccuracies are not systematic 	<ul style="list-style-type: none"> • Accuracy class 1 according to IEC62053-21 <p>Power measurements will not be sent during periods of unavailability of the communication network. Therefore, unavailability of the local communication network from time to time may lead to some inaccuracy in monthly or annual aggregated charge statistics but these would not be systematic with the Loxone Miniserver or charging station.</p>
---	--

Off-peak charging

Requirement	Technical solution adopted to meet the requirement
<p>The charge point:</p> <ul style="list-style-type: none"> • Has pre-set default charging hours which are outside of peak hours • Offers the owner the opportunity to accept, remove, or change the default charging hours on first use • Offers the owner the ability to change, remove, or set default charging hours any time after first use 	<p>A charging permission is always checked by the Miniserver first. The "Schedule" function block prevents charging during peak hours. The customer can easily change the times via the app or deactivate the schedule for a certain time.</p>
<p>The charge point is configured:</p> <ul style="list-style-type: none"> • To charge a vehicle during the default charging hours (if any), unless the owner overrides the default mode of charging during this time • Such that the owner can override the provision of demand side response services 	<p>By using the user management, users can be defined who are allowed to overwrite the schedule and who are not.</p> <p>If a DSR service is used, it can be overwritten if necessary.</p>

Randomised delay

Requirement	Technical solution adopted to meet the requirement
<p>The charge point is configured such that it must operate, at each relevant time, with a delay of random duration up to 600 seconds, determined to the nearest second each time</p>	<p>The charging permission is always given by the Miniserver.</p> <p>If a vehicle is connected and/or charging is permitted according to the schedule block, a delay is applied by means of a random number generator until the charging station is given the confirmation to enable charging.</p>

<p>The charge point is configured such that the maximum duration of this delay can be remotely increased to up to 1800 seconds if required</p>	<p>The maximum delay time can be increased easily in Loxone Config. This can be done remotely should the local network be connected to the internet and the relevant setting enabled in Loxone Config to allow remote changes.</p>
<p>The charge point is configured such that the random delay will not operate where:</p> <ul style="list-style-type: none"> • The owner or another relevant end-user has manually overridden it • An equivalent random delay has already been applied to the operation of the relevant charge point • The charge point is responding to a response DSR service 	<p>With the appropriate user authorisations, the owner or a user can overwrite the active delay in the app and thus activate charging immediately.</p> <p>The random delay time is only applied once before each charging cycle.</p> <p>If the charging station is associated with a DSR service, the additional logic for the delay time on the Miniserver must be removed via the Loxone Config.</p>

Security

Requirement	Technical solution adopted to meet the requirement
<p>General principles</p> <p>The charge point is designed, manufactured, and configured to provide appropriate protection:</p> <ul style="list-style-type: none"> • Against the risk of harm to, or disruption of the electricity system • Against the risk of harm to, or disruption of, the charge point • For the personal data of the owner and any other end-user of the relevant charge point 	<p>The housing is made of robust plastic and is IK08 rated. The inside of the charging station is protected with two different covers and screwed tight several times.</p> <p>The charging station is designed without a display or switch and therefore has no weak points in the design.</p> <p>All important data is stored on the Miniserver and not on the charging station itself, to be found at another installation location.</p>
<p>Passwords</p> <p>The charge point is configured such that where passwords are used on it:</p> <ul style="list-style-type: none"> • The password is unique to the charge point and not derived from, or based on, publicly available information, or is set by the owner • The password cannot be reset to a default password applying to both the charge point and other charge points 	<p>No passwords are used or stored on the charging station.</p>
<p>Software</p> <p>The charge point incorporates software which is able to be securely</p>	<p>Before updating the charging station, the Miniserver must always be updated with a new firmware version. The transfer of data is encrypted and can only be</p>

<p>updated using adequate cryptographic measures to protect against cyber attack</p>	<p>carried out by users with the appropriate authorisation. An update can be carried out via the Loxone Config or the app by users with relevant permission.</p>
<p>Software</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> • It checks for security updates available when first set up by the owner and periodically after • It verified the authenticity and integrity of each prospective software update by reference to both the data's origin and its contents and only applies the update if the authenticity and integrity of the software have been validated • By default, it provides notifications to the owner about prospective software updates • The owner can implement software updates without undue difficulty 	<p>If a new update is provided for the charging station, it must first be downloaded to the Miniserver. The customer will be informed about an available update in the app.</p> <p>Before the charging station receives the update, the Miniserver checks the update file in advance.</p> <p>The transmission of the update to the device is always checked for correctness by checksums. The charging station only starts with the new version if the update was successfully transferred, otherwise it retains the old version.</p> <p>In the event of a failed update, the owner is informed.</p>
<p>Software</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> • It verifies via secure boot mechanisms that its software has not been altered other than in accordance with a validated software update • If unauthorised change to software is detected, it notifies the owner and does not connect to a communications network other than for purposes of this notification 	<p>Only if the update is successfully transferred, the charging station starts with the new version, otherwise it keeps the previous version.</p> <p>The Miniserver always checks the version of the charging station for compatibility; if the update fails, the owner is notified.</p> <p>It is not possible to change the software directly on the device because the processor memory is protected.</p>
<p>Sensitive security parameters</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> • Security credentials stored on the charge point are protected using robust security measures • Software does not use hard-coded security credentials 	<p>No passwords are stored on the charging station.</p> <p>The passwords on the Miniserver are stored securely and must meet certain requirements. Only users with appropriate authorisation can change passwords. The default password must be changed when the Miniserver is put into operation.</p>

<p>Secure communication</p> <p>The charge point is configured such that communications it sends are encrypted</p>	<p>Communication between the charging station and the Miniserver only takes place if the charging station was able to correctly solve an authentication challenge. Otherwise, the device is not supported and charging operation is not possible.</p> <p>Once the authentication challenge has been solved, the communication itself is encrypted for both Air (radio) and Tree (wired) communications.</p>
<p>Data inputs</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> • Data inputs are verified so that the type and format of the data is consistent with that expected for the function • If such data cannot be verified, it is discarded or ignored by the charge point in a relevant manner 	<p>All data sent to the charging station is checked for correctness with a checksum. Only correct data is accepted and executed by the charging station. This check also takes place on the Miniserver, so only correct data is accepted, otherwise the device is requested to send the data again.</p>
<p>Ease of use</p> <p>The charge point is configured to minimise the inputs required from the owner in connection with its set-up and operation</p>	<p>In order to make the installation and commissioning of the charging station with the Miniserver easy to implement, there is a template in which all function blocks are connected together as required. This includes the schedule block, the random delay function, the logging of the individual charging cycles as well as the integration of the energy meter.</p> <p>This is commissioned and the template installed as part of the Loxone installation by a recognised Loxone Partner.</p> <p>The end user then only has to plug in the vehicle and can charge. Changes at a user level can then be made easily through the app if necessary.</p>
<p>Ease of use</p> <p>The charge point is configured such that any personal data can be deleted from it by the owner without undue difficulty</p>	<p>No data is stored on the charging station. If the charging station is replaced, no data needs to be deleted.</p> <p>All data is stored on the Miniserver. Only users with the appropriate access permission are allowed to delete the recorded data.</p>
<p>Protection against attack</p> <p>The charge point is designed and manufactured to provide an adequate level of protection against physical damage to the charge point</p>	<p>The housing is made of robust plastic and is IK08 rated. The inside of the charging station is protected with two different covers and screwed tight several times.</p> <p>The charging station is designed without a display or switch and therefore has no weak points in the design.</p>

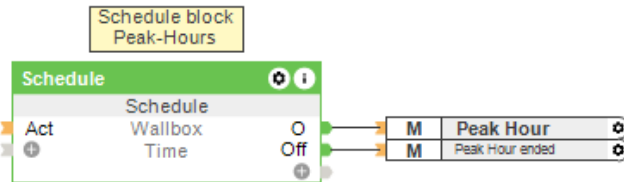
<p>Protection against attack</p> <p>The charge point incorporates a tamper-protection boundary to protect the internal components of the charge point</p>	<p>The interface between the charging station and the Miniserver (Air, Tree) and to the Modbus energy meter is defined as the tamper boundary. If the interface is breached, e.g. by short-circuiting or cutting off, the owner is notified.</p>
<p>Protection against attack</p> <p>The charge point is designed and manufactured to provide an adequate level of protection to its user interfaces and against use or attempted use of the charge point other than through the user interface</p>	<p>The physical charging station itself by default doesn't include any user interfaces other than the status light. There is a separate interface via the Loxone App.</p> <p>Should the user opt for the additional different control elements in the Loxone portfolio (Touch Pure, NFC Code Touch, Touch Pure Flex) there is adequate levels of protection that charging cannot be forcible initiated via these as they would only accept authorised/intended requests.</p>
<p>Protection against attack</p> <p>The charge point is configured such that:</p> <ul style="list-style-type: none"> • If there is an attempt to breach the tamper-protection boundary, the owner is notified • Its software runs with only the minimum level of access privileges required to deliver functionality • Any logical or network interfaces that are not required for the normal operation of the charge point or otherwise comply with the Regulations are disabled • Software services are not available to the owner unless necessary for the relevant charge point to operate • Any hardware interfaces that are used for the purposes of testing or development, but not otherwise during the operation of the charge point are not exposed 	<p>If the tamper protection boundary is breached, a notification is relayed from the Miniserver to the owner via their smart phone app. Additionally, a notification can be sent via email.</p> <p>During initial setup, the user can define how the charging station should behave if the tamper boundary is breached. The following options are available: Stop the charging process immediately, allow/reduce a charging process to a certain power or keep the current charging power.</p> <p>At the final test in the production of the charging station, all interfaces that are only required for development purposes and production tests are protected and are not accessible to the owner.</p>
<p>Security log</p> <p>The charge point incorporates a security log – an electronic record which includes attempts (whether or not successful) to:</p> <ul style="list-style-type: none"> • Breach the tamper-protection boundary • Tamper with the relevant charge point 	<p>If the tamper boundary is breached, the owner receives a notification and this event is also stored on the Miniserver with the current timestamp and the affected charging station. If the function is restored properly, this is also stored in a log file.</p> <p>The timezone is set when the Miniserver is commissioned.</p>

- Gain unauthorised access to the charge point

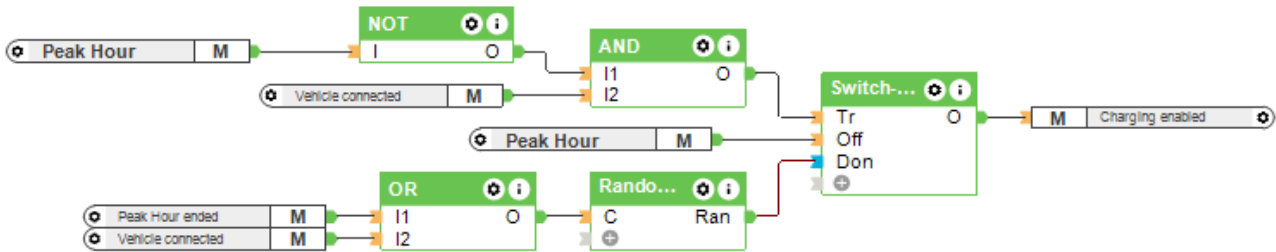
These entries must record the time and date the event occurred (by reference to Coordinated Universal Time).

Loxone-Config Template

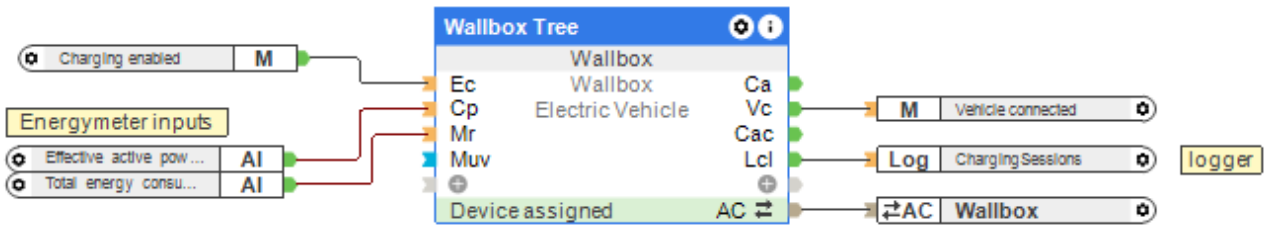
Overview



Randomised Delay
calculates a delay between 0 and 600s.
The delay time is always calculated when a vehicle is connected again or when the peak hours are over.







Wallbox function block:
- enable charging if outside the peak hours
- log every session into a local file
- energymeter readings are connected
- interface to charging station (AC)



Schedule - Peak Hours

Edit Timer / Schedule ✕

User defined Operating Modes

    Note: If multiple modes are enabled the top most one will be used!




Schedule

	00:00	03:00	06:00	09:00	12:00	15:00	18:00	21:00	24:00
Public Holiday (0)									
Holiday (1)									
School Holidays/Day off (2)									
Monday (3)									
Tuesday (4)									
Wednesday (5)									
Thursday (6)									
Friday (7)									
Saturday (8)									
Sunday (9)									

Selected row

From

To Activation required

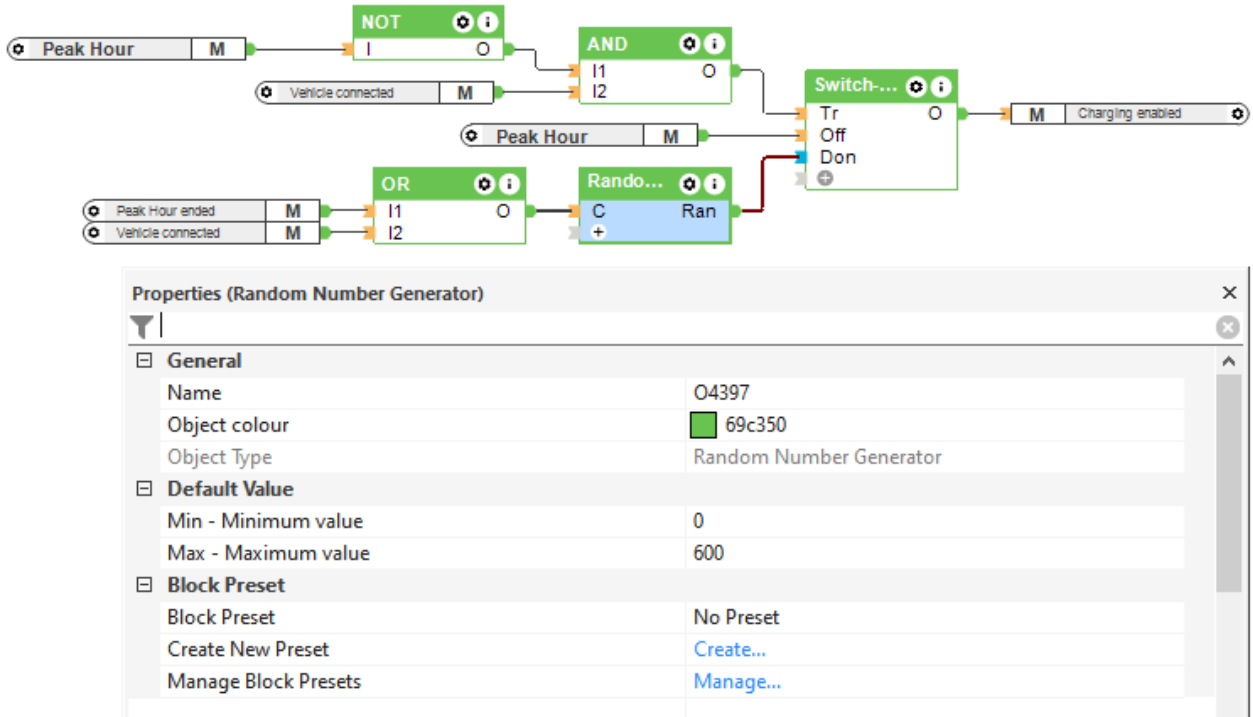
  

Note: Selection with Ctrl allows the copying of an entry!

The above schedule is an example. The Peak and Off-Peak hours would be customisable as per the electricity supplier for that site/property. The default could follow the concept of the Economy 7 hours if needs be, for example.

Randomised Delay

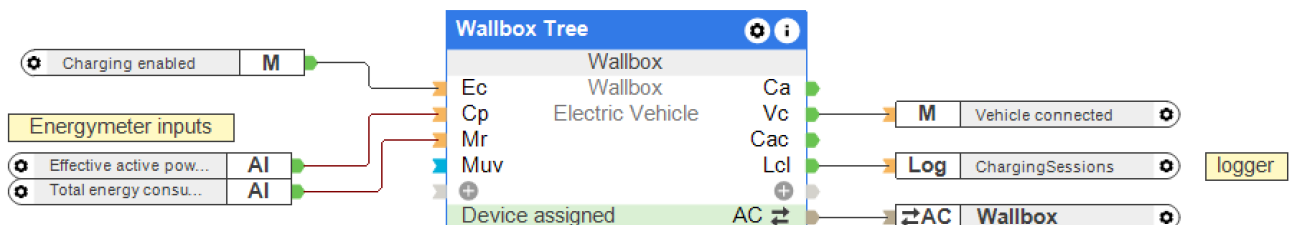
Randomised Delay
calculates a delay between 0 and 600s.
The delay time is always calculated when a vehicle is connected again or when the peak hours are over.



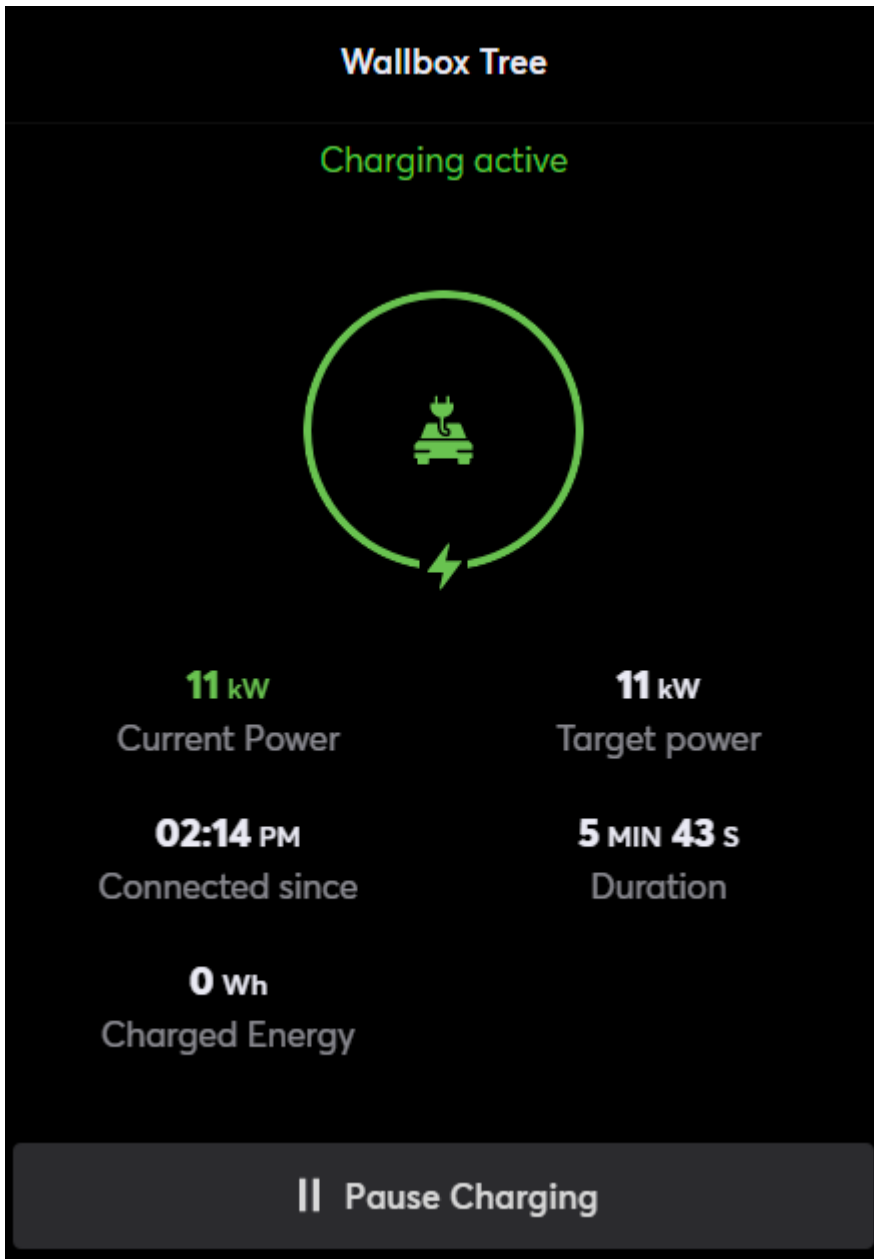
If a vehicle is connected and you are outside the peak hours, a random number between 0 and 600 is generated. As per the regulations, this can be remotely increased to up to 1800 seconds if required provided the option for remote configuration of that Miniserver has been completed. After this time has elapsed, charging permission is only given for the corresponding charging station.

Wallbox Function Block

Wallbox function block:
 - enable charging if outside the peak hours
 - log every session into a local file
 - energymeter readings are connected
 - interface to charging station (AC)



Loxone App - Overview



Version History

Version	Date	Notes
V0.1	5.6.2023	Initial release
V1.0	12.6.2023	Corrections and small adjustments (screenshots)