

# **KeContact P20**

## **UDP Programmers Guide**



Automation by innovation.

## Comments to this manual

In this manual you will find warnings against possible dangerous situations. The used symbols apply to the following meanings:



### **Notice**

*Notes on use of equipment and useful practical tips are identified by "Notice". Notices do not contain any information that draws attention to potentially dangerous or harmful functions.*

- ▶ Step of a sequence of operations.

## Concerning this manual

This manual is intended for use by customers and personnel with the relevant technical knowledge in the applicable area and appropriate to the operations they are required to perform.

Target group:

- Customers/personnel with some programming knowledge

## List of changes

Version: V1.40	Date: 27.03.2015
<b>Page</b>	<b>Description</b>
6	Chapter "UDP Broadcast Messages": added state 5
8	Chapter "UDP Command "report2": added state 5

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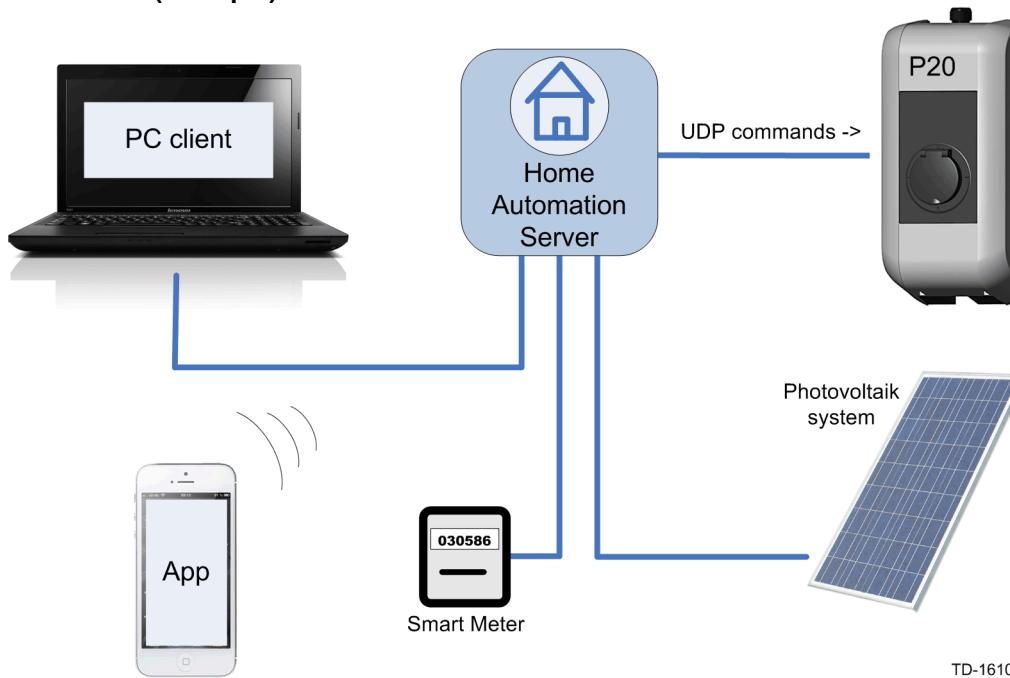
# 1 Introduction

The KeContact P20 Programmers Guide provides the necessary information to send UDP commands to the KeContact P20 Charging station. It gives you the possibility to get status information from the Charging station or control it with an UDP Client (PC software or Smartphone App).

The **User Datagram Protocol (UDP)** is a simple network protocol that belongs to the transport layer of the Internet protocol family.

With suitable Home automation controllers it is also possible to realize e.g. a reduction of your energy consumption in conjunction with a photovoltaic system and your P20 Charging station.

### Schematic overview (example)



TD-1610-050-a

## 1.1 Requirements

The following requirements have to be met to use the P20 UDP functionality:

- KeContact P20 Charging station with network connection (LSA+ socket)  
Product code: KC-P20-xxxxxx2x-xxx or KC-P20-xxxxxx3x-xxx
- Firmware version 2.01m11 or higher.
- Enabled UDP function with DIP-switch DWS1.3 = ON (for details about the DIP-switches please refer to the "KeContact P20 Installation manual").
- Router or Smart-Home Server with integrated Web Server (e.g. Loxone MiniServer).
- A PC or Smartphone for sending the UDP commands.  
This also requires a suitable UDP Client software or UDP App.

## 2 UDP commands

### 2.1 General information

When using UDP commands it is strongly recommended to protect your Smart-Home-Network on **port 7090** against unauthorized control or external attacks.

The wallbox reacts on broadcasts and directly addressed commands. In a group of several P20 charging stations, direct addressing should be used because otherwise all wallboxes would react.

The commands are sent to the wallbox as simple text commands (without end characters such as <CR> or <LF>).

The answers come as data packages with up to 512 bytes and are formatted in JSON standard; each data line within the structure is terminated with <LF> (0x0A).

Notes:

For the JSON format, open-source-parsers are available.

UDP does not support any error correction function. Please verify the effect of the sent commands yourself.

Port information:

Send port = UDP 7090

Receive port = UDP 7090

### 2.2 UDP Broadcast Messages

The broadcast messages are intended to avoid the permanent polling of the following described reports.

If there is a change of the status, the authorization, the enable input X1, the maximum possible current pre-sets (temperature reduction), or an increase of the energy value a message is generated for the change.

For a detailed evaluation of the status, the corresponding report can be queried.

## UDP commands

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<b>UDP broadcast:</b>															
<u>Messages:</u>	<pre>{   "State": 2   {"Plug": 1}   {"Input": 0}   {"Enable sys": 1}   {"Max curr": 32000}   {"E pres": 999999}</pre>														
<u>Description:</u>	<p>"State" = Current state of the wallbox      0 : starting      1 : not ready for charging; e.g. unplugged, X1 or "ena" not enabled,      RFID not enabled,.....      2 : ready for charging; waiting for EV charging request (S2)      3 : charging      4 : error      5 : authorization rejected</p> <p>"Plug" = Current condition of the loading connection</p> <table border="1"> <tr><td>0</td><td>unplugged</td></tr> <tr><td>1</td><td>plugged on wallbox</td></tr> <tr><td>3</td><td>plugged on wallbox</td><td>plug locked</td></tr> <tr><td>5</td><td>plugged on wallbox</td><td>plugged on EV</td></tr> <tr><td>7</td><td>plugged on wallbox</td><td>plug locked</td><td>plugged on EV</td></tr> </table> <p>"Input" = State of the potential free Enable input X1.      When using the input, please pay attention to the information      in the installation manual.</p> <p>"Enable sys" = Enable state for charging (contains Enable input, RFID, UDP,...).</p> <p>"Max curr" = Current preset value via Control pilot in milliampere.</p> <p>"E pres" = Power consumption of the current loading session in 0,1Wh;      Reset with new loading session (state = 2).      "E pres" is used as a pulse output with a valence 10Wh per message      or 100 messages / kWh -&gt; full load 22kW      = one message every 1.6 sec</p>	0	unplugged	1	plugged on wallbox	3	plugged on wallbox	plug locked	5	plugged on wallbox	plugged on EV	7	plugged on wallbox	plug locked	plugged on EV
0	unplugged														
1	plugged on wallbox														
3	plugged on wallbox	plug locked													
5	plugged on wallbox	plugged on EV													
7	plugged on wallbox	plug locked	plugged on EV												

### 2.3 UDP command “i”

<b>UDP command:</b> <b>i</b>	
<u>Reply:</u>	"Firmware": "KEBA P20 v 2.01m11 (140606-055125)"
<u>Description:</u>	Returns the product family and the firmware version of the wallbox. Serves to a possible inventory of the network by means of a broadcast command with a subsequent report for detailed queries.

## **2.4 UDP command “failsafe”**

<b>UDP command:</b>	<b>failsafe [Timeout] [curr] [save]</b>	
<u>Reply:</u>	"TCH-OK :done"	
<u>Description:</u>	<p>[Timeout] 10...600 = Within this time, a command "ena" or "curr" must be received, in order not to activate the failsafe mode.</p> <p>[curr] 0 = Disables the charging process when triggering the failsafe function, similar to command "ena 0".</p> <p>6000...63000 = Reduces the maximum allowed charging current to this value (in milliampere), when triggering the failsafe function.</p> <p>[save] 0 = Activates the failsafe function only temporary until the next startup of the device.</p> <p>1 = Saves the settings into the EEPROM in order to activate the failsafe function automatically, after restarting the device.</p> <p>By default, this feature is disabled and must be enabled once or after each restart. This function is used to limit a network wall box with a lost communication (network error, server failure, ...) to a defined state. This can be necessary in conjunction with a peak load limitation, in order not to overload the main fuses.</p> <p>An activated failsafe function is indicated by the wallbox. In this case the LED segments do not longer illuminate the full width, but only indicates the current state with the middle two LED segments.</p> <p>A triggered failsafe function can be also recognized over UDP: in the report 2 the "Enable sys" value goes to 0, and the charge current setting "Max curr" goes to the default value of "Curr FS".</p> <p>After the failsafe function has been activated due to a timeout, you must set the values of current and the load enable again using the associated commands "curr" and "ena".</p>	

## **2.5 UDP command „report“**

<b>UDP command:</b>	<b>report 1</b>
<u>Reply:</u>	<pre>{   "ID": "1",   "Product": "KC-P20-ES240010-000",   "Serial": "15017355",   "Firmware": "KEBA P20 v 2.01m11 (140610-073512)" }</pre>
<u>Description:</u>	<p>"ID" = ID of the retrieved report.</p> <p>"Product-ID" = Model name (variant)</p> <p>"Serial" = Serial number</p> <p>"Firmware" = Firmware version</p>

UDP command:	<b>report 2</b>														
<u>Reply:</u>	<pre>{     "ID": "2",     "State": 2,     "Error1": 99,     "Error2": 99,     "Plug": 1,     "Enable sys": 1,     "Enable user": 1,     "Max curr": 32000,     "Max curr %": 1000,     "Curr HW": 32000,     "Curr user": 63000,     "Curr FS": 63000,     "Tmo FS": 0,     "Output": 0,     "Input": 0,     "Serial": "15017355",     "Sec": 4294967296, }</pre>														
<u>Description:</u>	<p>"ID" = ID of the retrieved report.</p> <p>"State" = Current state of the wallbox</p> <ul style="list-style-type: none"> <li>0 : starting</li> <li>1 : not ready for charging; e.g. unplugged, X1 or "ena" not enabled, RFID not enabled,.....</li> <li>2 : ready for charging; waiting for EV charging request (S2)</li> <li>3 : charging</li> <li>4 : error</li> <li>5 : authorization rejected</li> </ul> <p>"Error 1" = Detail code for state 4; exceptions see FAQ on <a href="http://www.kecontact.com">www.kecontact.com</a></p> <p>"Error 2" = Detail code for state 4 exception #6 see FAQ on <a href="http://www.kecontact.com">www.kecontact.com</a></p> <p>"Plug" = Current condition of the loading connection</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>0</td><td>unplugged</td></tr> <tr><td>1</td><td>plugged on wallbox</td></tr> <tr><td>3</td><td>plugged on wallbox</td><td>plug locked</td></tr> <tr><td>5</td><td>plugged on wallbox</td><td>plugged on EV</td></tr> <tr><td>7</td><td>plugged on wallbox</td><td>plug locked</td><td>plugged on EV</td></tr> </table> <p>"Enable sys" = Enable state for charging (contains Enable input, RFID, UDP,...).</p> <p>"Enable user" = Enable condition via UDP.</p> <p>"Max curr" = Current preset value via Control pilot in milliampere.</p> <p>"Max curr %" = Current preset value via Control pilot in 0,1% of the PWM value</p> <p>"Curr HW" = Highest possible charging current of the charging connection. Contains device maximum, DIP-switch setting, cable coding and temperature reduction.</p> <p>"Curr user" = Current preset value of the user via UDP; Default = 63000mA.</p> <p>"Curr FS" = Current preset value for the Failsafe function.</p> <p>"Tmo FS" = Communication timeout before triggering the Failsafe function.</p> <p>"Output" = State of the relay output X2.</p> <p>"Input" = State of the potential free Enable input X1. When using the input, please pay attention to the information in the installation manual.</p> <p>"Serial" = Serial number</p> <p>"Sec" = Current system clock since restart of the wallbox.</p>	0	unplugged	1	plugged on wallbox	3	plugged on wallbox	plug locked	5	plugged on wallbox	plugged on EV	7	plugged on wallbox	plug locked	plugged on EV
0	unplugged														
1	plugged on wallbox														
3	plugged on wallbox	plug locked													
5	plugged on wallbox	plugged on EV													
7	plugged on wallbox	plug locked	plugged on EV												

<b>UDP command:</b>	<b>report 3</b>
<u>Reply:</u>	<pre>{     "ID": "3",     "U1": 230,     "U2": 230,     "U3": 230,     "I1": 99999,     "I2": 99999,     "I3": 99999,     "P": 99999999,     "PF": 1000,     "E pres": 999999,     "E total": 9999999999,     "Serial": "15017355",     "Sec": 4294967296, }</pre>
<u>Description:</u>	<p>"ID" = ID of the retrieved report.</p> <p>"U1" "U2" "U3"   = Current voltage in V.</p> <p>"I1" "I2" "I3"   = Current current value of the 3 phases in mA.</p> <p>"P" = Current power in mW (Real Power).</p> <p>"PF" = Power factor in 0,1% (cosphi)</p> <p>"E pres" = Power consumption of the current loading session in 0,1Wh; Reset with new loading session (state = 2).</p> <p>"total" = Total power consumption (persistent) without current loading session 0,1Wh; Is summed up after each completed charging session (state = 0).</p> <p>"Serial" = Serial number</p>

## 2.6 UDP command “ena”

<b>UDP command:</b>	<b>ena [n]</b>
<u>Reply:</u>	"TCH-OK :done"
<u>Description:</u>	<p>[n] is the enable state (binary)</p> <p>0 = Disabled; is indicated with a blue flashing LED. The same as used with the external enable input.</p> <p>1 = Enabled</p> <p>The answer TCH-OK confirms only the receiving of the command and not the correctness of the value.</p> <p>A value unequal to 0 or 1 is also confirmed and is leading to deactivation.</p> <p>The correct reception can be verified using the proper report or by getting the corresponding broadcast message.</p> <p><b>ATTENTION:</b> Some electric vehicles (EVs) do not yet meet the standard requirements and an "ena 0" can lead to an error in the wallbox.</p>

## **2.7 UDP command “curr”**

<b>UDP command:</b>	<b>curr [n]</b>
<u>Reply:</u>	"TCH-OK :done"
<u>Description:</u>	<p>[n] is the maximum allowed loading current in milliampere.</p> <p>The answer TCH-OK confirms only the receiving of the command and not the correctness of the value.</p> <p>Allowed are values between 6000mA und 63000mA. Invalid values are discarded and the default is set to 63000mA. The value is also depending on the DIP-switch settings and the used cable of the charging station.</p> <p>The correct reception can be verified using the proper report or by getting the corresponding broadcast message.</p>

## **2.8 UDP command “output”**

<b>UDP command:</b>	<b>output [n]</b>
<u>Reply:</u>	"TCH-OK :done"
<u>Description:</u>	<p>[n] is output state of the relay terminal X2 under the connector panel cover of the wallbox (binary value).</p> <p>0 = open 1 = closed</p> <p>&gt;=10 = Pulse output with the specified number of pulses (pulses / kWh) and is stored in the EEPROM; reasonably usable up to 150.</p> <p>The answer TCH-OK confirms only the receiving of the command and not the correctness of the value.</p> <p>Values between 2 and 9 are not answered (reserved functions). Invalid values (e.g. letters) are leading to a deactivation of the relay.</p> <p>The correct reception can be verified using the proper report.</p>



**Note**

*The controllability is only available if the default function of the output is not activated via the DIP-switch DSW1.2.*

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### 3 Further informations



Loxone MiniServer (example)

#### Loxone MiniServer

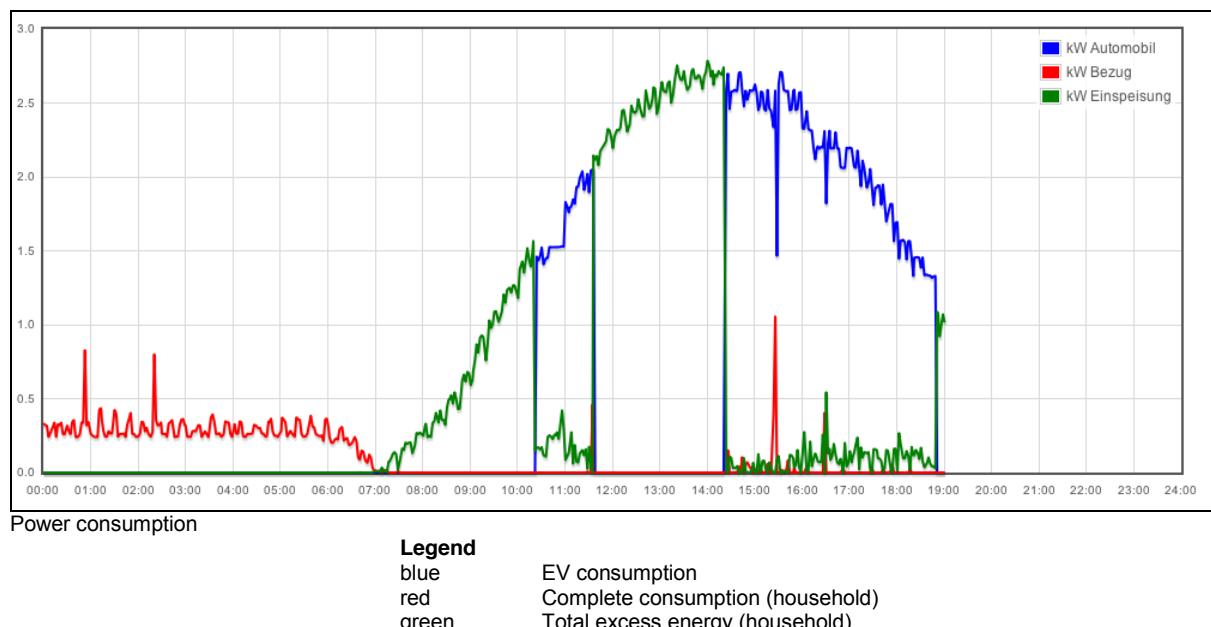
The P20 UDP features are tested with Loxone MiniServer for house automations. For details please see [www.loxone.com](http://www.loxone.com).

For the installation please follow the detailed instructions under the documentation section “Loxone config -> Communication with UDP”.

#### Software solution for energy optimization

This is an existing Open-Source implementation for optimizing the excess energy of a photovoltaic system combined with KeContact P20 UDP-interface and other KNX-based systems for Linux x86 and ARM (Raspberry Pi).

<http://www.eb-systeme.de>



[www.kecontact.com](http://www.kecontact.com)