Briefing Paper

Leonardo ENERGY

# USB charging sockets

**Guy Kasier**
E&D Systems
Available online October 2010

Source: Berker

Home of the Future

european COPPER institute

# USB charging sockets



Have you ever forgetten to take your mobile phone charger to the office, a conference or on a trip? You ask your colleagues whether they have a suitable charger for your phone, but alas, nobody shares your preference for the brand you use, so nobody can provide a charger with a suitable connecter.

In 2009, the European Commission, together with the largest mobile phone manufacturers, reached an agreement on a standard for charging these mobile phones. Since the spring of 2010, every mobile phone sold in Europe has had to have a Micro-USB connection. The phone has to be charged using this connection and it can also be used for transferring data. The multitude of different chargers with different connectors should, in time, become a thing of the past. Every mobile phone could then be charged with the same connector. This standard will not only prove more convenient for the user, but will ensure a substantial reduction of the environmental impact from chargers that are no longer used.

A number of connector manufacturers are now cleverly responding to this trend by putting recessed USB chargers on the market for homes, offices, hotels, etc. In this article, we will look at these new units in detail.


*The current variety of connectors for mobile phones is doomed to die. From now on, mobile phones in Europe will invariably have a Micro-USB connection for charging them. Photo source: Connectland)*

*In the near future, a simple USB type A to Micro-USB cable will be enough to charge all kinds of portable and chargeable devices.*

**Other devices are also included**

In 2008, the five largest mobile phone producers sold 962 million phones (Source: IDC – International Data Corporation). The EU Directive is targeted at these producers. However, there are many other wireless devices that we use every day

which also need charging now and again. We only have to think of MP3 players, digital cameras, navigation systems, Bluetooth headsets, games consoles, PDAs, pocket PCs, and other devices. Such devices are generally supplied with a charger with a certain connector that differs from device to device. As a result, the fruit bowl in the living room no longer has fruit in it, but various chargers that we invariably have to untangle when we want to use one of them.


*We all use many devices every day in which the battery has to be charged regularly.*

**How can we charge the devices?**
One objective of this EU Directive is that, in time, mobile phones will no longer be sold with a charger in the box. If desired, the charger can still be purchased separately as an accessory. But how do we charge our telephone? There are a number of possibilities.

First of all we can charge wireless mobile devices from a computer USB port. The disadvantage of this way of charging is of course that there has to be a computer around and it must be switched on. Charging the phone overnight means that the computer consumes energy all night long in much larger quantities than needed to charge the phone.

A second way consists of using a separate charger with a USB connector. Such units can be plugged into any electric socket to do their job. The disadvantage is that you sometimes forget where you last put your charger, or you forget to take it with you when travelling. If you only have one charger at home, who in your family has priority to charge an empty battery? If the charger is left in the socket after charging a phone, it has a relatively large standby consumption of more than 200 mW.

A third way consists of charging the devices with a USB charger in the car, which is connected to the 12V power outlet. This is only useful when travelling by car.

A fourth way in which we can charge wireless devices is brought to us by certain connector manufacturers. They have included USB charger sockets in their range and are now (autumn 2010) being put on the market. These units are installed in a

recessed box or cable duct. They are finished with the same cover plates that are used for switches and ordinary electric sockets and can be fully integrated into homes, offices, hotels, hospitals, etc.

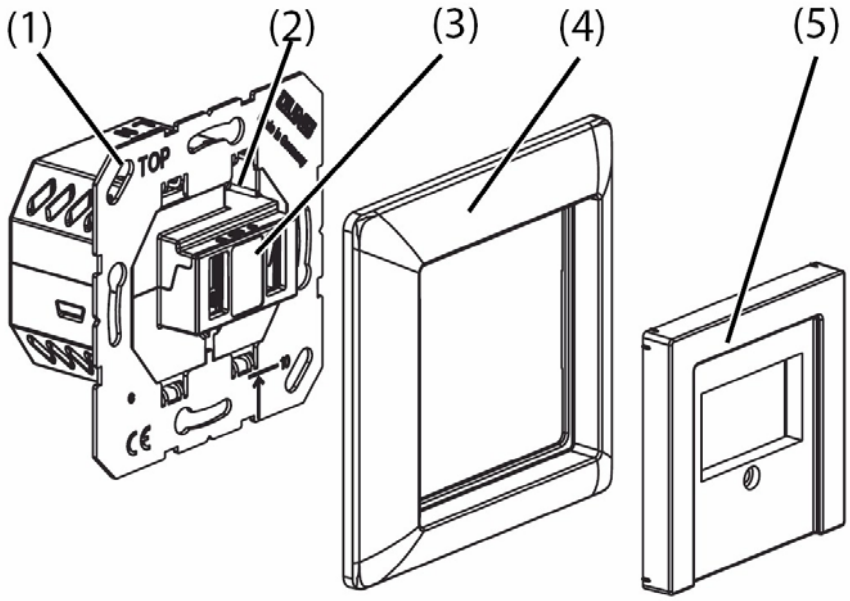

*Most USB charger sockets have two USB connectors. Source: Berker)*

**Installation of the recessed USB chargers**

In a newly constructed home, the recessed USB chargers can be incorporated into the general design of the electrical installation. Ideally, a number of USB sockets are distributed throughout the home: the living room, the kitchen, the office and every bedroom. After all, children have their own arsenal of wireless chargeable devices.

Recessed USB chargers can also be installed in existing homes. However, each time at the expense of an ordinary socket. After all, such USB chargers need a recessed box and an electricity supply. This method can be a disadvantage if there are already too few sockets in the home.

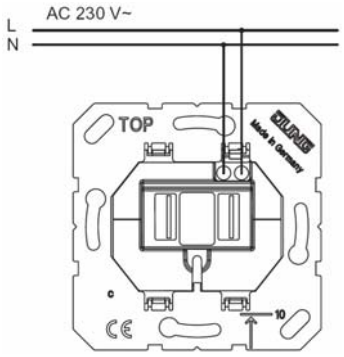
Producers also see potential in the installation of these chargers in hotel rooms, office environments, caravans, camper vans, boats and yachts, in the first class compartments of trains, and for building into furniture such as desks, kitchen cupboards or cupboards for the living room and bedroom.




1. *USB recessed module*
2. *Mains connection terminals*
3. *USB connectors*
4. *Cover frame*
5. *Middle plate (Source: Jung)*

**Mains voltage or low voltage?**

With various producers, the mains voltage can be used as a supply for these chargers (110 – 240V, 50/60 Hz). The charging voltage (secondary) is always 5 Vdc. The standby consumption is generally less than 100 mW and is thus far below the EU standard of 1W in 2010 and 0.5W as of 2013. The consumption per USB contact is a maximum of 700 mA. For the entire recessed USB charger with two USB connectors, the maximum charging current is thus 1,400 mA. The USB terminals and connections are internally protected against overcurrent and short-circuits.




*Easily connectable, wherever there is a mains supply and recessed box. (Source: Jung)*

Certain producers also have recessed USB chargers on the market with a low voltage connection, generally with a 24Vdc – 30Vdc supply, which is ideal for connecting these USB chargers directly to a KNX bus system, for example (the

standard for building management systems). In such cases, it is sometimes also possible to convert the USB data to KNX data, and vice-versa. The USB socket and the connected mobile device are thus integrated into the entire KNX system.

**Conclusion**

It will be easier for the user. From now on, it will be sufficient to have a simple USB cable to hand in order to charge all kinds of portable equipment. The advantage of USB charger sockets is that you can charge up at a number of places in the home, and never again can you forget where you last used the separate charger.
And two devices can also be charged at the same time in the same place.
No more arguments over who is first!


*With the USB charger sockets we can charge a number of different types of devices at the same time. (Source: Berker)*