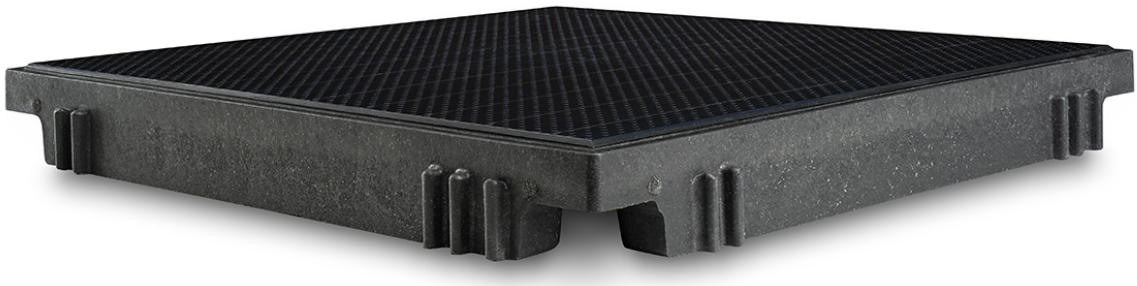

Installation Manual for the Platio System V10.2

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Important safety information

Disclaimer

This manual provides important safety instructions about the installation, maintenance and handling of Platio solar modules. Anyone installing Platio solar pavement must read these guidelines carefully and strictly follow the instructions. Not following these instructions may result in death, injury or property damage. The installation and handling of PV modules require professional skills and should only be performed by qualified professionals. The installers must inform end-users (consumers) the information given in this material accordingly.

The information contained in this manual is subject to change by Innovatív Térburkolatfejlesztő Kft. owner of Platio brand without prior notice. Innovatív Térburkolatfejlesztő Kft. shall not be held responsible for damages of any kind, including – without limitation – bodily harm, injury or damage to property, in connection with handling Platio modules, system installation, or compliance or non-compliance with the instructions given in this manual.

Safety precautions

Before installing, wire, operate and / or service the Platio modules and other electrical equipment, all instructions should be read and understood. Platio connectors pass direct current (DC) when exposed to sunlight or other light sources. Contact with electrically active parts of the module, such as connectors, can result in injury or death, not depending on whether or not the module and the other electrical equipment have been connected.

Any connection to the grid, batteries, any wiring expect connecting factory wiring (while never exceeding SELV – Safety Extra Low Voltage, see next paragraph) or connection to any device must be installed by licensed electricians in accordance to all applicable national or international electrical codes.

WHEN CONNECTING PLATIO ELEMENTS TOGETHER IN SERIES NEVER UNDER ANY CIRCUMSTANCES EXCEED THE SELV (SAFETY EXTRA LOW VOLTAGE) CODE APPLICABLE FOR DIRECT CURRENT IN YOUR AREA EVEN UNDER THE WORST LOCAL TEMPERATURE CONDITIONS!

Do not allow children or unauthorized persons near the installation site or storage area of modules.

Protective clothing as non-slip gloves, clothes, safety shoes and any other measures applicable in your area or required by code is a must during installation. Prevent direct contact with anything more than SELV (Safety Extra Low Voltage code applicable in your area), and to protect hands from sharp edges.

Never install modules in rain or morning dew and always take appropriate measures to prevent any water ingress into the connectors. Water in connectors can cause serious malfunctions resulting failure in Platio elements and any other connected devices.

Use electrically insulated tools to reduce the risk of electric shock.

Do not use or install damaged modules.

Contact with Platio elements surfaces may cause electric shock if the front glass is broken.

The Platio modules do not contain any serviceable parts. Do not attempt to repair any part of the module. Do not disassemble a module or remove any module part.

Do not immerse modules in water or constantly expose modules to water either fresh or salt (for example from fountains, sea spray). Continuously exposing modules to salt or sulfur incurs the risk of corrosion in connectors. Do not use the product in continuously acidic or alkaline environment.

ONLY USE MICROINVERTERS, CHARGE CONTROLLERS, BATTERIES AND ANY OTHER DEVICES THAT MEET ALL THE REQUIRED STANDARDS AND REQUIREMENTS IN YOUR REGION AND HAS BEEN APPROVED BY INNOVATÍV TÉRBURKOLATFEJLESZTŐ KFT!

Only copper conductor material should be used. Select a suitable conductor gauge to minimize voltage drop and ensure that the conductor ampacity complies with local regulations.

Storage

Modules should be stored in a dry and ventilated environment to avoid direct sunlight and moisture. If modules are stored outdoors (for example a construction site), the storage time should be less than 1 week, and extra precautions should be taken to prevent Platio elements from being exposed to moisture or sunlight. **Storing Platio elements under unsatisfactory conditions may cause water infiltrate into the packaging, thus the stagnant water may cause permanent damage to the units due to water infiltration into the uncovered cable ends** (which under normal operation are covered with waterproof connectors).

Unpack the pallets carefully, following the steps shown on the pallet. Unpack, transport and store the modules with care. Percussion or shaking of the packed or unpacked products must be avoided. Always try to avoid contact of two glass surfaces. Keep all

electrical contacts clean and dry at all times. Cable ends of the product are coming uncovered from the factory and are not waterproof when unmated. When installing modules, connector should be connected to each other as soon as possible or appropriate measures should be taken to avoid moisture and dust penetrating into the open cable ends.

Keep the product away from acids, alkalis or any corrosive material, fire and extreme temperatures.

FAILURE TO COMPLY WITH THESE INSTRUCTIONS WILL VOID INNOVATÍV TÉRBURKOLATFEJLESZTŐ KFT. WARRANTY.

Circular economy - packaging

Circular economy is considered as a very important goal of our company. When packing our products, it is a very important aspect to ensure the greatest possible protection and thus the products arrive in perfect condition, but it is also our goal to make our packaging materials from re-used materials, mostly materials that came to our factory as packaging material as well. If sent back to our factory address all packaging materials will be reused or properly recycled if cannot be used again.

Before installation

Platio elements come with 2 types of anti-slip surface. All of these meets the requirements of CEN / TS 16165:2012 and DIN 51130 for outdoor surfaces. For more details see datasheet.

On heavily snow and ice-covered, heavily trafficked surfaces only use the “Opal” extra anti-slip variant Platio units. Always consult with the representatives of Innovatív Térburkolatfejlesztő Kft. in selecting the suitable surface variant for the climate and use in question. Please consult the Innovatív Térburkolatfejlesztő Kft. technical support

department for more information on the use of modules in special climates, such as an altitude greater than 2000 m.

Before installing modules please obtain information about any requirements and necessary approvals for the site, installation and inspection from the relevant authorities. Consult your local authority for guidelines and requirements.

Always ensure that the wiring is correct before starting up the system. If the measured open circuit voltage (Voc) and short-circuit current (Isc) differ substantially from the specifications, this indicates that there is a wiring fault.

When modules have been pre-installed, but the system has not been connected to the grid or charge controllers yet, each module string should be kept under open-circuit conditions and proper actions should be taken to avoid dust and moisture penetration inside the open cable ends.

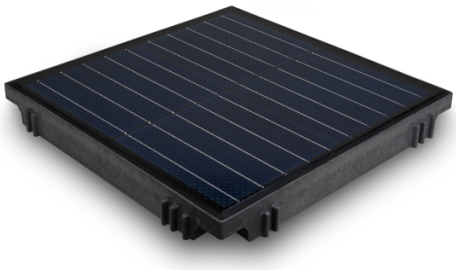
Introduction

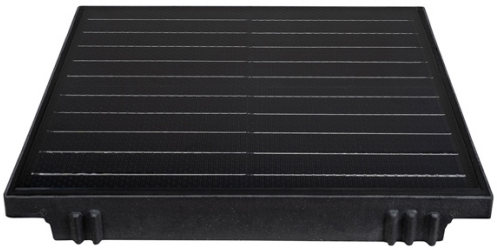
The product

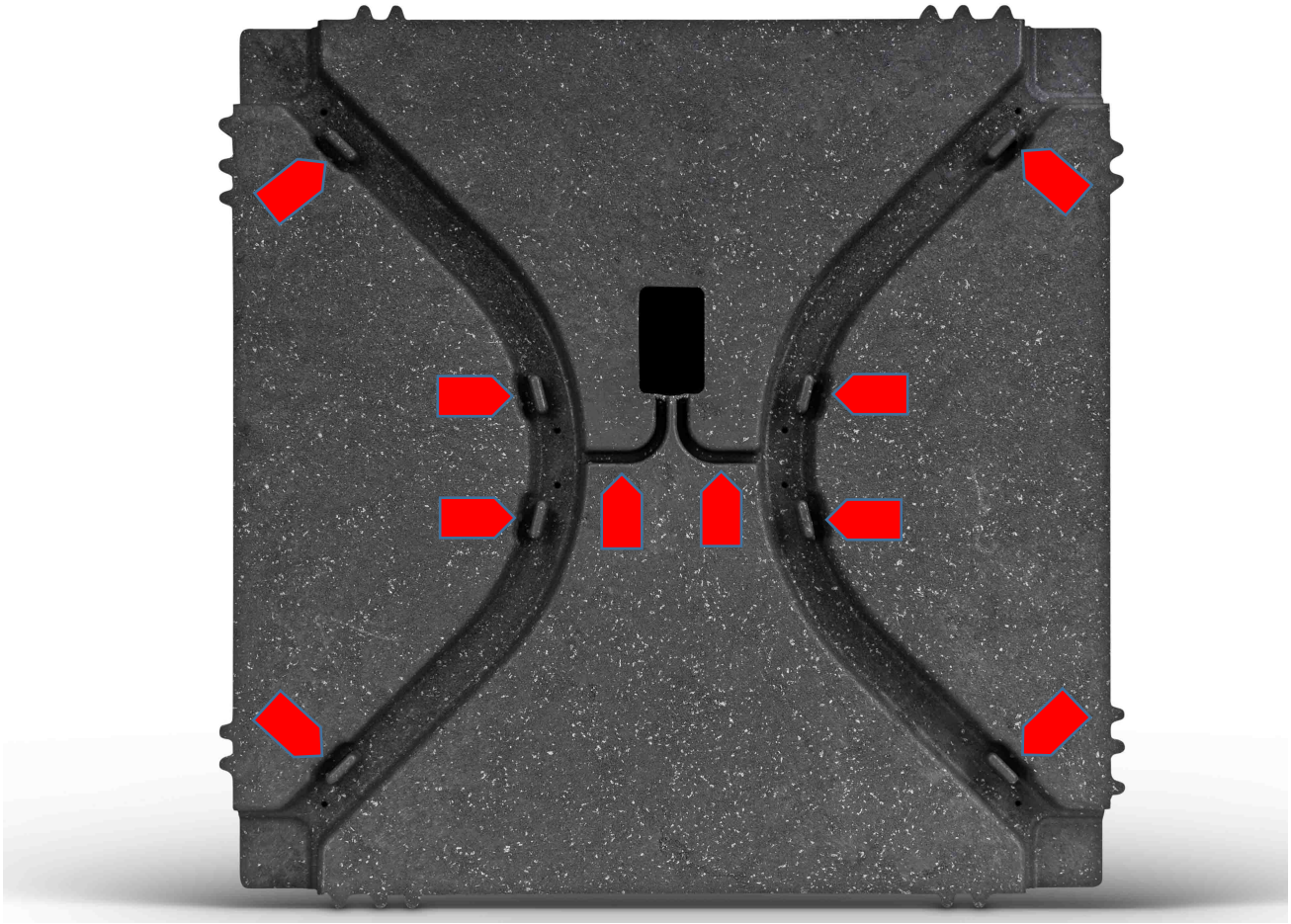
PLATIO is an innovative, solar paver tile, that provides clean energy source, also is an eco-friendly product, as its base is made out of recycled plastic. PLATIO functions as solar panels, and we offer an aesthetic and space-saving solution for areas where conventional solar technologies cannot be deployed.

It comes with an ‘Ocean Blue’ and a ‘Midnight Black’ color, of which first is made with polycrystalline and the latter with monocrystalline technology.

It also comes with two types of surface treatment, ‘Clear’ which is an acid-etched dotted pattern for a more high-tech feel, and an ‘Opal’ version for situations where ice and snow coverage is a trait of the winter season. It is an extra anti-slip blasted surface.

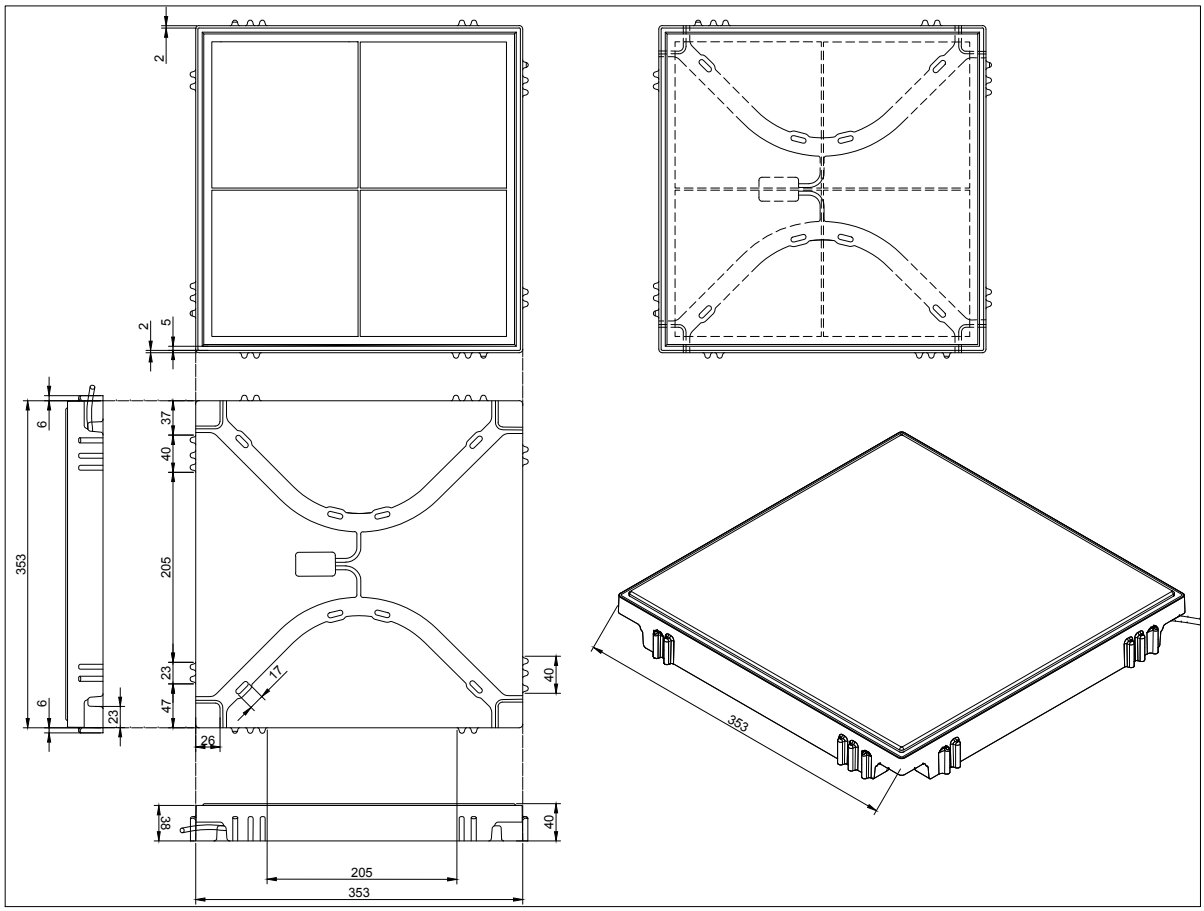






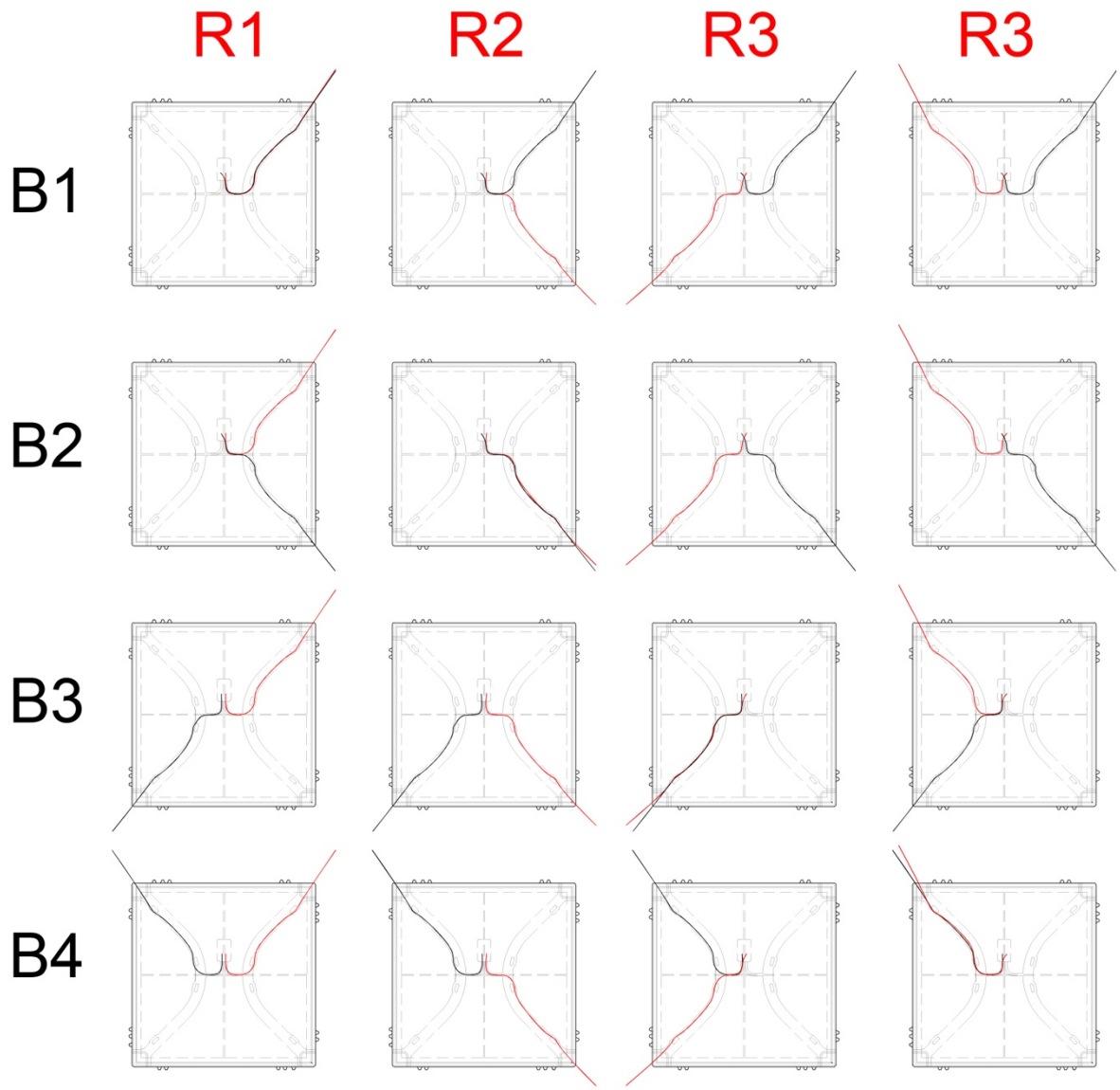
On the picture above the cabling routes have been marked with red arrows. In these routes the cables should be tucked in according to those shown in Cable routing chapter.

Product characteristics



Platio units from May, 2021 have one main part. Units come with two free-swinging cables, one red (+) and one black (-).

Units can be fitted to any side of any other unit, however usually it is recommended to install all the units in the same arrangements as it is shown below. As it is illustrated, rotating the angle of the bus bars by 90° is not visually appealing, therefore it should be avoided. However as far as the circuit is built-up properly and red cables always connect to black cables of neighboring elements, the system will be working seamless regardless of placement of the units.



Every unit has two cables (+ and -) and those two cables can be fixed in 4 positions each, thus creating 16 cable layout variations for the product as it is shown above. On the illustration the viewing point is considered above the elements, but invisible parts have also been drawn for ease of understanding. Keep in mind that the cables can ran on the top of each other. The cables are fixed with cable routes and fixing elements which are made of the material of the elements as shown on page 9 with red arrows.

WARNING!

The installation of the PLATIO Systems (except the construction of the foundation and curbs; see below) must under all circumstances be completed by experts certified by Innovatív Térburkolatfejlesztő Kft.

Outdoor understructures

Platio Solar Pavers should be installed in a similar way to paving slabs. There is no need for a special method during the preparation of the substructure of the cladding, therefore, when describing the construction of different types of cladding, we limit ourselves to solutions for Platio elements that are different from the commonly used element claddings. In all cases, the relevant plans and regulations and standards apply.

Platio elements can be built with several substructures. The nature and stratification of the substructure must be determined by the designer of the surrounding area. If the installation takes place in place of an existing paved surface, in case the substructure is in good condition, the Platio frames can be installed directly. Innovatív Térburkolatfejlesztő Kft does not take responsibility for damages resulting from a poorly constructed substructure.

The requirements of the designer of the given project (for example, a road planner, landscape architect, or architect, as the case may be) always apply when installing the substructure, since in the case of the given project, the soil, the conditions of use, etc. always make different substructures necessary or feasible. Innovatív Térburkolatfejlesztő Kft. shall not be liable for any damages resulting from the selection of an unsuitable substructure.

Retrofitting

If the Platio surface is used to replace an existing paved surface, the first step is to cut the elements of the existing pavement (at the edges of the planned Platio surface) and pick up the paving elements to be removed and transport them to a suitable landfill. For aesthetic and durability reasons, it is recommended to use an edging from the same material at the edges of the Platio surface from the elements of the given cladding, similar to the example below.

The bedding (the layer between the cladding elements and the foundation) must be smoothed and / or leveled. **If a sand layer has been used, replace it! The vase of Platio elements can be unstable when placed in a sand bed!** If the Platio is to be built as part of a new investment, the earthwork and substructure must first be built according to the plans of the designer responsible for the surrounding surfaces (see the following sections).

The Platio surface can also be installed directly on an existing paved surface, if the condition of the pavement allows it and the difference in level compared to the surrounding tiles is not a problem. Typically, such a surface can be a concrete or asphalt pavement.

Concrete foundations

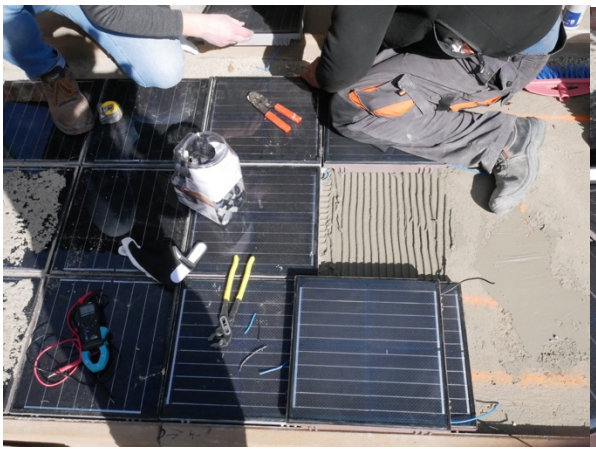
For outdoor installation (so not on a terrace or in the vicinity of a building), the concrete base is the recommended solution. This is the recommended solution if vehicle traffic takes place on the given pavement, as well as on concrete substructure recommended for ramps and sloping pavements. If necessary, depending on the properties of the soil and the use, it may also be necessary to reinforce the concrete substructure. When constructing concrete substructures, often expansion joints, dilatation is necessary; to determine the frequency of such gaps, read the technical data sheet of the product or contact its manufacturer!

The soil must be prepared with compaction appropriate to the soil type, reaching a depth and slope corresponding to the frost limit. The slope is approx. It is worth setting it to 0.5%, 2-3% laterally. Slopes larger than this are not visually favorable and visible to the naked eye. Slopes lower than this do not provide adequate drainage of precipitation.

An anti-freeze layer should be applied to the earthworks if the local climate and soil characteristics make this necessary. This is made depending on the valid plans (depending on the frost boundary and additional layers), but at a minimum thickness of 15 cm and typically with crushed stone with a fraction of 0-70 mm. The antifreeze layer must be compacted in accordance with regulations (e.g. road standards).

Reinforced or unreinforced concrete substructure shall be formed on the above layers.

Partially or completely cementitious adhesive mortar embedding is usually used on concrete substructures. It is advisable to install the mortar by placing the mortar required below one row of Platio frames at a time, then placing the Platio frame elements on it. It is advisable to check the horizontality with a cord. To accurately adjust the height in the starting corners, use an assembled element, so that the height of the other elements is formed at the height of their frame. After completing one line, proceed in the same way as the others. See Laying Platio units chapter.




Wiring and installing the covers as described in the Platio Solar Paver Installation section. Concrete substructures are typically impermeable to water, so it is advisable to use a impermeable joint, especially if the mortar is the bedding layer. If the standard quality sample cross-section described below is used, mix the grout according to the product data sheet and then fill the joints with it. Try to leave as thin a layer of grout on the surface of the Platio elements as possible, so that it can be easily removed when dried. In the case of larger surfaces, typically where one of the dimensions of the surface exceeds 4 meters, apply an expansion gap or expansion in the joint. This may be omitted for certain polymer-based materials.

If you use a joint other than the material below, perform a test grout and surface test to make sure the material can be easily removed from the top surface of the Platio.

Permeable foundations

This type of substructure is often used on pavements, parks, gardens used by pedestrians. Its advantage is its water permeability, which can be useful for the surrounding green areas, and its price per square meter is more favorable.

For permeable understructures it is recommended to use crushed stone bed without powder fraction, e.g. 0-4 (mm) fraction. Platio Solar Pavers have negligible height differences thus no additional setting in height is necessary. Keep in mind that permeable foundations are more exposed to the risk of subsidence than concrete foundations, so using concrete foundations is recommended.

If the surface to be installed is adjacent to such a substructure, the two must be separated (for example by a steel edge) and the necessary concrete substructure must be constructed in this way.

Building integrated understructures

Fixed on concrete slabs

In places like roof gardens or balconies Platio units can be fixed to the concrete slab itself. In this case use of watertight grouting is a must. For this method expansion joints are necessary; contact the manufacturer of the grout for the frequency of such joints (around 5 m). For certain polymeric based materials, it may be possible to omit the expansion joints.

Using sleepers

In places like roof gardens, patios or balconies if the drainage of the concrete slab is given a layer of gravel and structure of sleepers and spacers (wood or other material) can be used.

Using pedestals / buzons

In places like roof gardens, patios or balconies if the drainage of the concrete slab is given a structure of pedestals and sleepers (wood or other material) can be used.

Laying the Platio units

According to the above, under all circumstances must this process be completed by experts approved by Innovatív Térburkolatfejlesztő Kft. as the developer of the PLATIO Systems, so that the following is of informative nature only.

16-21 pcs of Platio Solar Paver element forms a DC system. This should be established using the DC cable whose ends are built into the elements at the factory. The system is either connected directly to the electrical device (microinverter, charge controller, etc., depending on the purpose of the application) or it is recommended to

route the wiring from the Platio Solar system to the inverter / point of use with H07-RNF 2x2.5 rubber cable in a suitable conduit (protective tube).

Placement of the units

Platio surfaces always have to be planned beforehand the installation, so that the layout of the units, the cabling directions and connecting points of the conduits are known. When using microinverters, usually 16-21 pieces of units are creating a circuit.

It recommended to mark the direction of electrical connections with, for example, marking spray.

The fastest way to install Platio Solar Pavers is to work in teams of two people, especially when in the case of not too experienced installers. It is advantageous if one member of the team is an experienced bricklayer and the other has some experience with electrical equipment, but it is not necessary to employ a qualified electrician at this stage of the installation.

The elements are installed in the same way as normal cladding elements. The slope must be checked with twine or other methods. If necessary, the elements can be adjusted or punched with a rubber hammer or by hand. Once a unit is in place, preferably do not walk or carry material on its surface until all components of the Platio Solar Paver have been installed. Keep the surface of the mainframe relatively clean, free of debris, sand and mortar.

After each row of Platio Solar Pavers, check the voltage on the system with a regular multimeter. If the voltage measurement is showing the voltage suitable for the amount of elements, the connections are fine. Otherwise check the connectors if the cables have been properly inserted into the connectors and the buttons have been pushed entirely. **As it is checked in every row, if a fault in connecting the connectors occurs, it can be fixed easily.**

During the process, excessive contamination of the elements should be avoided by, for example, earth, sand, etc. can damage the top surface of the elements. Keep in mind that free ends of electric cables (without the connectors) are not watertight.

It is advisable to check the horizontality with a cord. To precisely adjust the height in the starting corners, use an assembled element, so that the height of the other elements is formed at the height of their frame. After completing one line, proceed in the same way as the others.

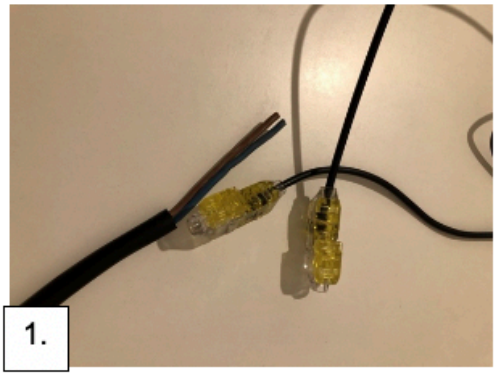
Connecting the cables

Platio Solar Pavers are connected with the cables built-in the units, plus additional connectors that our company also provides. The connector is either a ‘Coolsplice’ unit or an ‘MGC’ connector. The choice between the two is based on the preference of the particular installer. In the case of ‘Coolsplice’ connector the electric bonding is created by pressing two buttons, in the case of MGC it is only one button.
Both connectors can only be mounted once, the joint cannot be loosened after compression. The connectors provide IPX8 protection.

The connectors provided by our company is suitable for connection to 2.5 - 4 mm2 stranded insulated wire. If other wiring is used, the connector must be clamped and the connection made in another standard way.

Follow the instructions for the pictures on the next page.

- Figure 1: Clean the connector and rubber cables so that they are not exposed to dirt (pos, mud, sand, etc.)
- Figure 2: Push the cable all the way in as far as it will go / to the stop at the connector halfway
- Figure 3: Press the yellow push tab until it clicks
- Figure 4: If the push tab is not completely flat, the connection is not correct. The compression shown in the picture is not enough, the yellow and the transparent plastic side must be completely aligned!
- Figure 5: The correctly compressed connector
- Figure 6: If it fails by hand, you can safely use a pliers to increase the force
- Figure 7: Then, if desired, the two connectors can be hung together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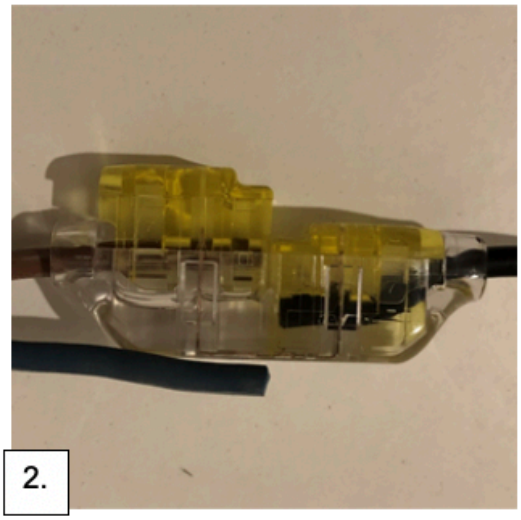
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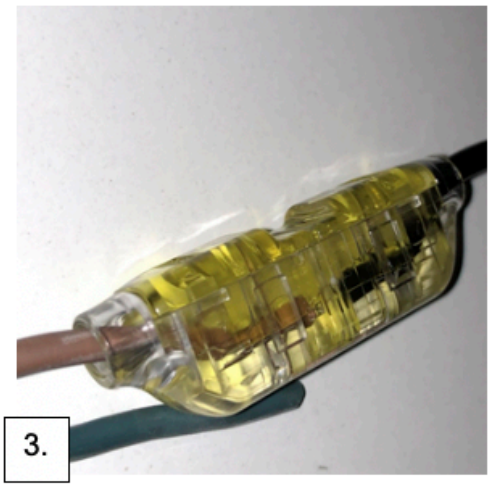
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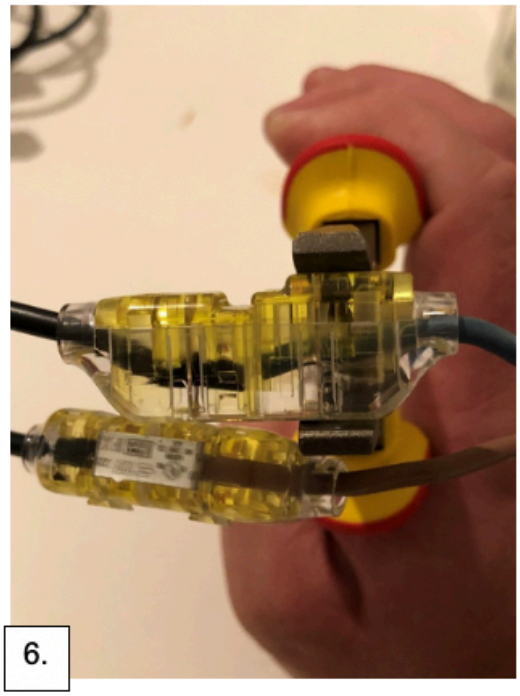
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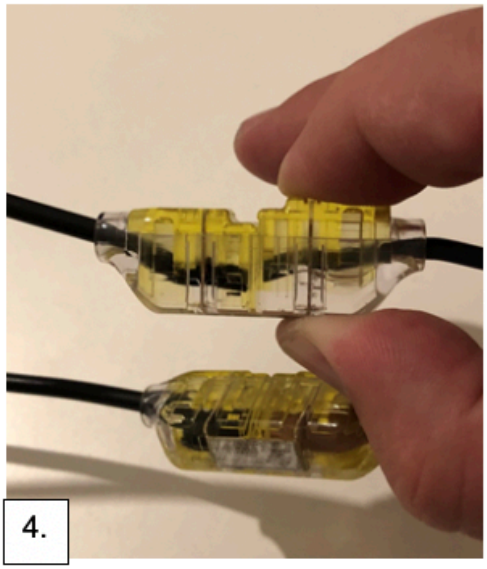
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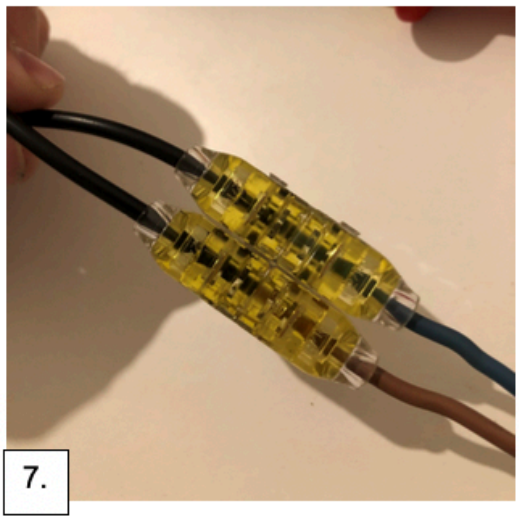
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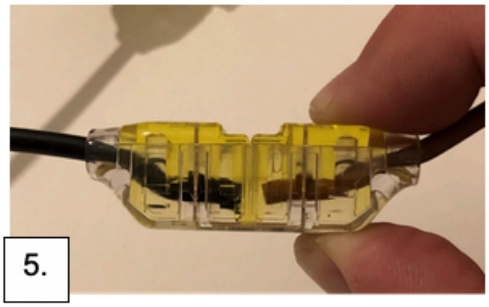

5.

In the case of the MGC connector, it is the same process, but only one button is present.

Red cables are always connecting to black ones and black ones are always connecting to red ones.

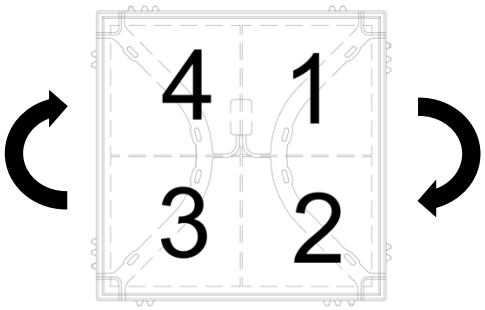
The connectors contacted together (either Coolsplice or MGC) are then tucked in the corners as shown below.

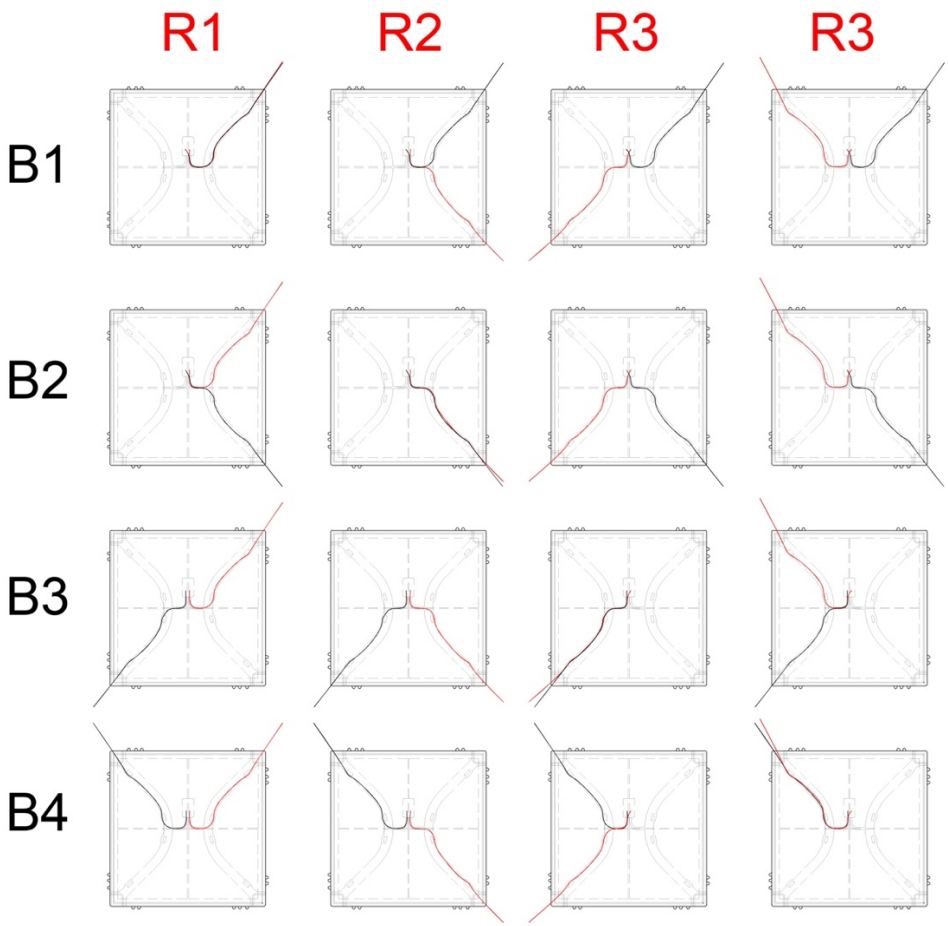
Cable routing

Below are examples of cable arrangements for circuits. All Platio elements on the border of an installation are suitable for cable output. For understandable reasons, in general, if you are not laying a row, you can only tie a non-prime number of elements to a row. The surfaces to be formed can be arranged in rasters by breaking them down to their prime factors.

If we name the unit's four output points and connector cavity 1, 2, 3, 4 (like below) and name the red cable 'R' and black cable 'B', we get the 16 possibilities shown below. These 16 patterns are important in order to be properly reference when designing systems. On the illustration the viewing point is considered above the elements, but invisible parts have also been drawn for ease of understanding. Keep in mind that the

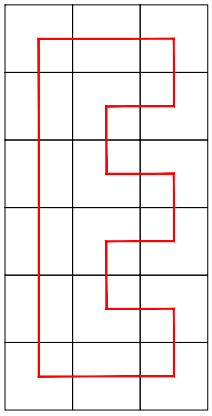
cables can ran on the top of each other. The cables are fixed with cable routes and fixing elements which are made of the material of the elements as shown below.



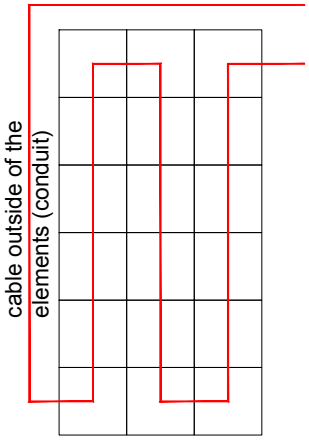


The main possible system layouts are shown on the next drawings with indication of the laying direction.

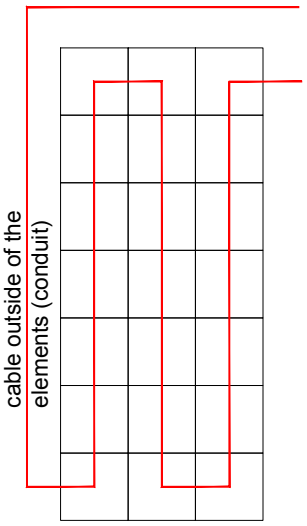
6 x 3 = 18



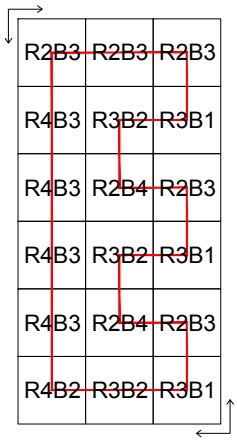
6 x 3 = 18



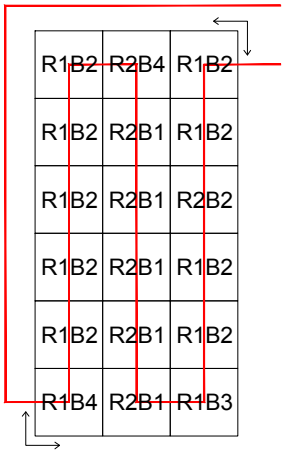
3 x 7 = 21



In this case, the cables to the inverter can be from any unit



In this case, the cables to the inverter are limited to the corners



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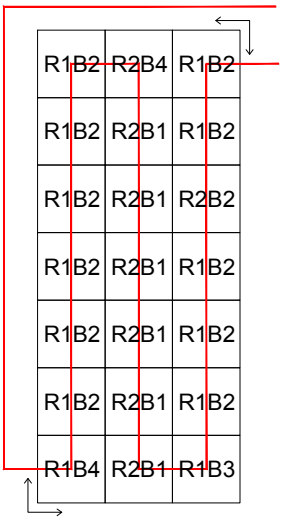
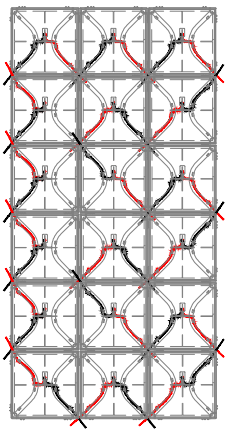
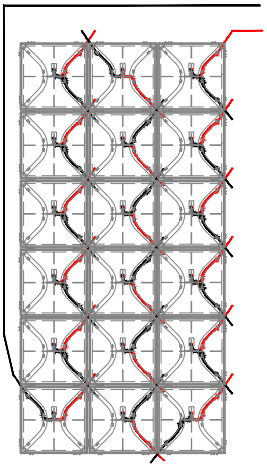


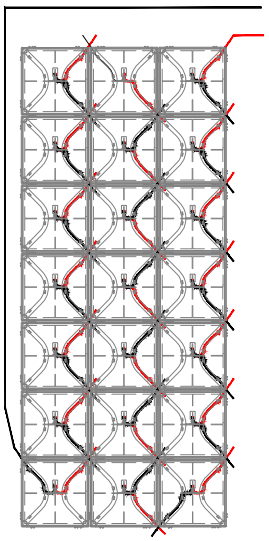
Real life solution

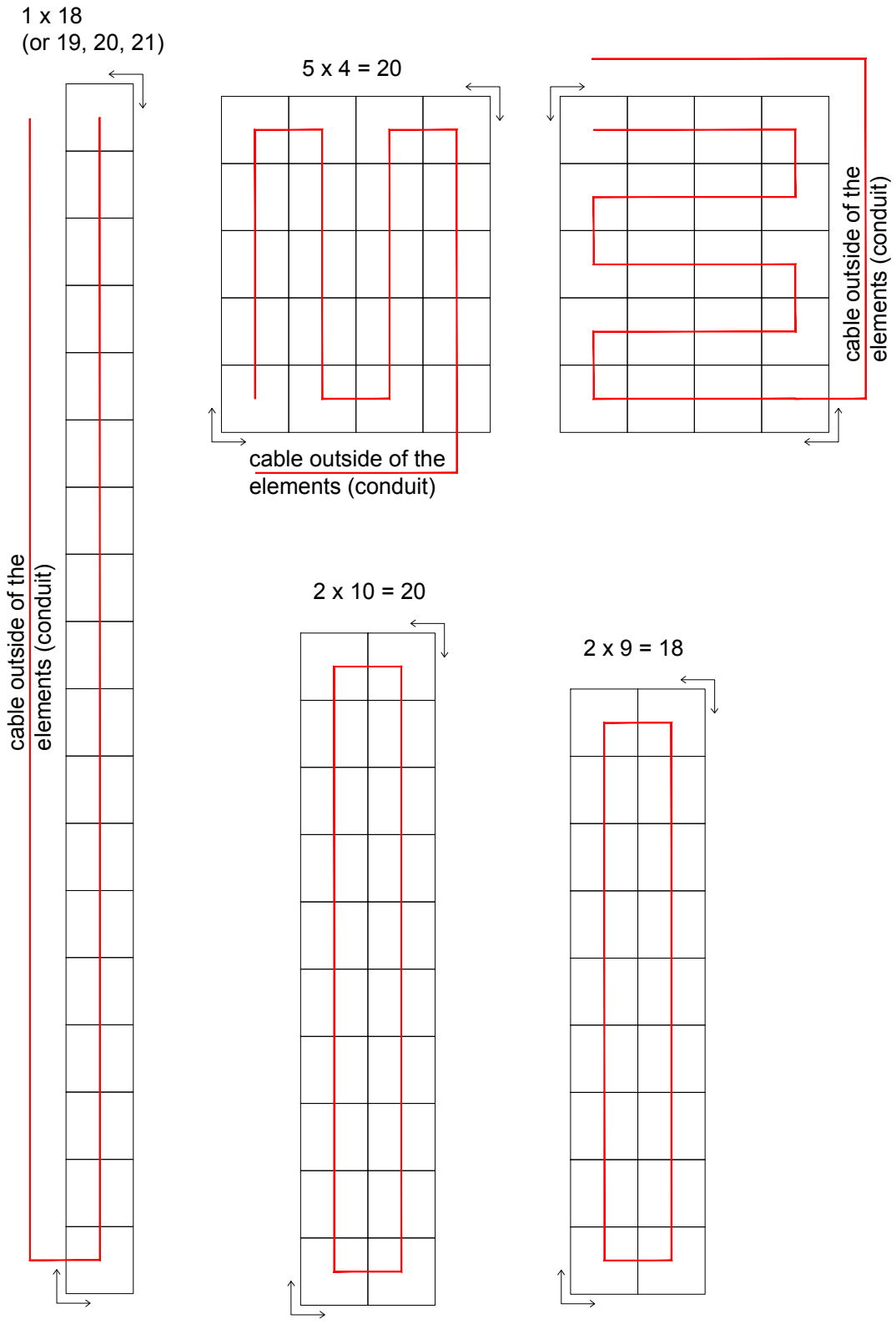


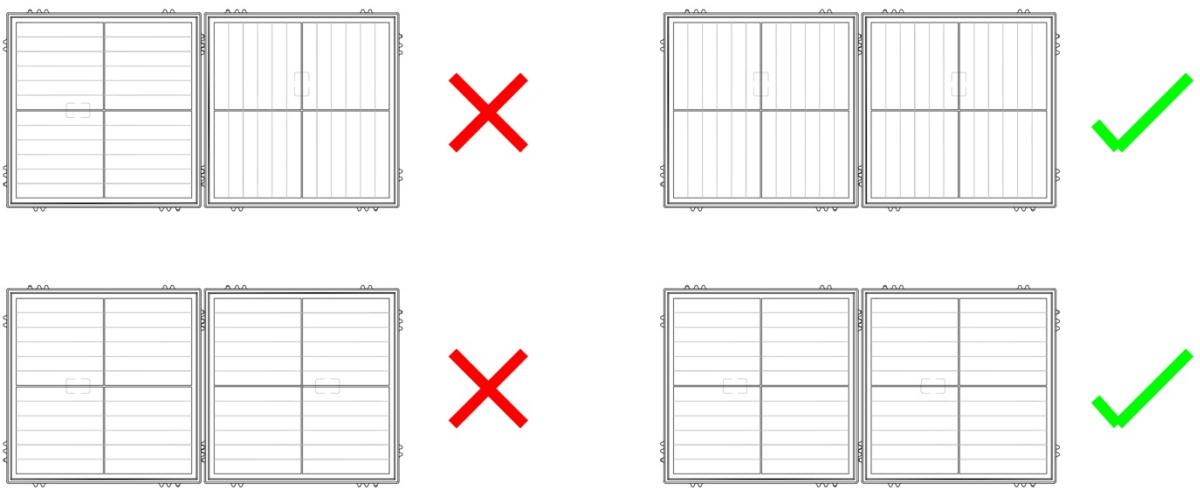
Real life solution



Real life solution

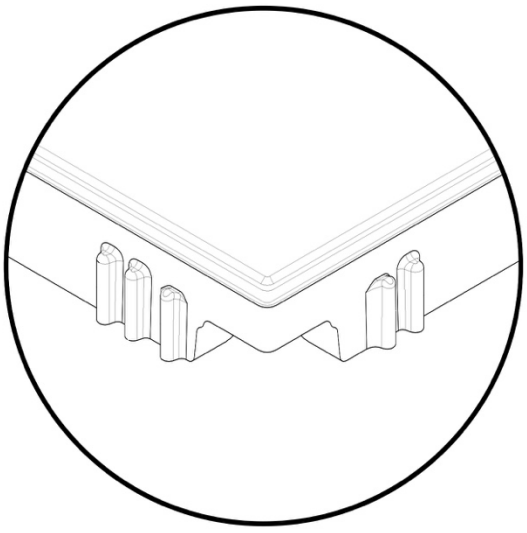


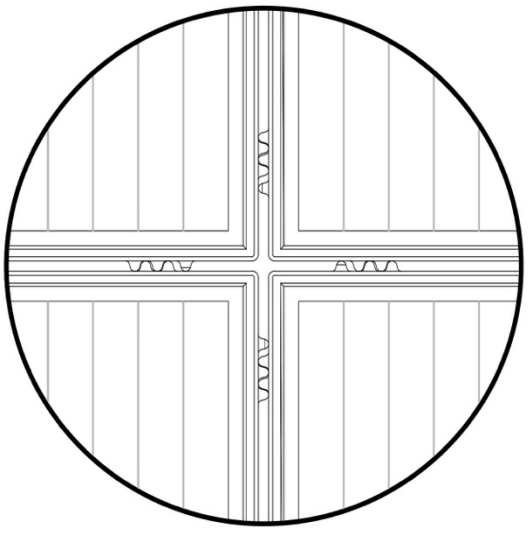

1 x 18
(or 19, 20, 21)
cable outside of the elements (conduit)
5 x 4 = 20
cable outside of the elements (conduit)
cable outside of the elements (conduit)
2 x 10 = 20
2 x 9 = 18



Avoid the solutions marked with ‘x’ and use solutions marked with tick, as those are visually more appealing.

The elements are coming with special spacer bumps keeping the elements exactly in the right place.





Connection to wires with factory wiring

The watertight connection of the factory cables to different types of wires (running to microinverters, DC/DC converters etc.) is recommend using the Coolsplice, “knife” system connector as described above.