

Terminal, isolating or connecting strip

The invention relates to a terminal, isolating or connecting strip as claimed in the descriptive part of claim 1.

10 The terminal and isolating strips which are used in telecommunications and data technology are fitted with insulation-piercing terminal contacts corresponding to DE 28 04 478 C2 and allow wiring in a plane. The connecting
15 contacts on the cable core side and switching side are arranged at the same working level at the front. The strips are latched onto mounting brackets and, when necessary, can be detached from the mounting bracket again, and removed, using a guide tool. Such a mounting
20 bracket is also described in DE 28 11 812 C2.

 The strips allow, for example, standardized cable junctions having twelve terminations to be constructed to form in each case 100 twin-core cables. Expansion is possible only by the use of further terminations in a new
25 housing. The further sealing of the wiring in the predetermined space of a cable junction necessitates miniaturization of the modules used, at the expense of the available area per contact slot in the distribution area, and thus means deterioration of the fitter's
30 working conditions and an adverse effect on the clarity of the wiring.

 The delineation of competence areas, which is becoming increasingly important and necessary, between

the network operator and the subscriber can be achieved only with difficulty using the known telecommunications and data technology modules.

DE-G 94 00 303.3 describes a terminal module in
5 which two rows of terminal strips are arranged at an angle of 90° with respect to one another, which terminal strips allow an insulation-piercing terminal technique, which avoids soldering and stripping and uses no screws, to be used in a very small space in standard connecting
10 sockets for data and communications technology.

It is disadvantageous that only terminals are implemented, but it is not possible to carry out isolation, changeover operations as well as tests and further functions.

15 The invention is based on the object of developing a terminal, isolating or connecting strip of the generic type, by means of very different circuit, protection and measurement tasks in telecommunications and data technology are ensured in a very small space,
20 with an increased wiring density, reliably and with a high level of operator convenience and clarity, it being necessary to ensure reliable separation between the competence areas of network operators and subscribers.

This object is achieved by the features of
25 claim 1.

The preferably 90° angle between the two terminal strips, in conjunction with the preferably angled insulation-piercing terminal contact elements, which are continuously formed over two planes according to the
30 invention, makes it possible to produce a universally usable strip for telecommunications and data technology, by means of which terminal, isolating and connecting tasks are possible as well as testing, measurement, protection and interruption-free changeover. Only the
35 contacts need be replaced and the corresponding functional elements, such as overvoltage protection plugs or the like, inserted in the insulating body, which is split in two.

Protection of the respective strip can be ensured

by inserting a magazine or, alternatively, protection of a single twin-core can be implemented.

5 A considerable reduction in the dimensions of the strip and, at the same time, a considerably larger and clearer distribution panel are achieved, such that a 33% greater wiring density and, at the same time, an available area per contact slot in the distribution area which is larger by virtually 40% are achieved in a standardized cable junction.

10 The distribution side points towards the fitter when the strip is in the final position and allows the strip to be wired up conveniently and reliably, as well as in a visually clear manner.

15 Wiring the strip in two planes makes it possible to prevent manipulation of the wiring in the cable core side at the bottom by suitable measures, for example by means of a frame which can be lead-sealed.

20 The wiring of the strip in two planes furthermore allows separation of the competence areas, namely of the network operator side (the cable core side at the bottom) and the distributor side (the distribution panel at the top).

25 The mounting bracket, which is equipped with two latch rows, the latching openings being arranged in the side surfaces so that a smooth upper edge is retained which largely precludes any risk of injury to the fitter, ensures convenient and reliable as well as clear wiring up in the first strip latching position, and a safe final position, which can be manipulated only with difficulty and can be released only using the wiring tool, in the second latching position.

30 The rear side of the mounting bracket has an elongated hole which enables continuously variable adjustment of the cable strand and/or of the blocking plug just by loosening the holder, so that a plurality of cable strands can run past one another on the rear wall of the mounting bracket.

35 Further embodiments of the invention provide for the fastening of the strip to profile rails or via a

flange to which the strip is screwed.

Further advantageous refinements of the invention result from the subclaims.

5 The invention will be explained in more detail in the following text with reference to exemplary embodiments of a terminal strip and of an isolating and connecting strip which are illustrated in the drawings, in which:

- 10 Fig. 1 shows the front view of a strip formed from the insulating body which is split in two (upper part and lower part),
- Fig. 2 shows the rear view of the strip according to Fig. 1,
- Fig. 3 shows the bottom view of the strip according to Fig. 1,
- 15 Fig. 4 shows the top view of the strip according to Fig. 1,
- Fig. 5 shows the section illustration (section B-B) of the strip according to Fig. 1 with an isolating or connecting contact inserted,
- 20 Fig. 6 shows the plan view of the isolating or connecting contact in Fig. 5,
- Fig. 7 shows the section illustration of the strip according to Fig. 1 with a connecting contact inserted,
- 25 Fig. 8 shows the plan view of the connecting contact in Fig. 7,
- Fig. 9 shows the section illustration of a cable junction with an insertion recess, mounting bracket with strip, protective dust cap,
- 30 Fig. 10 shows the front view of the mounting bracket, and
- 35 Fig. 11 shows the side view of the mounting bracket according to Fig. 10.

The terminal, isolating and connecting strip is preferably used for connecting plastic-insulated cable

cores and insulation wires, for example in terminations in order to construct, for example, cable junctions in telecommunications local cable networks.

5 A termination comprises, for example, ten strips each having ten twin-core cables, a mounting bracket 9 and a marking bracket with a plate (not illustrated), which can be used as an adapter to correct the wiring on the cable core side.

10 The physical design of the strips as claimed in the invention reduces the grid size of a termination in such a manner that four terminations can now be inserted into a bay in a cable junction instead of the three terminations until now. The packing density of the connections is increased by 33%, considerably improved
15 clarity and more space for the distribution panel being obtained at the same time.

The area available to the fitter in the distribution area is increased by virtually 40% per contact slot.

20 As a result of the strip being wired in two planes, the cable core side is located at the bottom and the distribution panel side is rotated through 90° pointing upwards towards the fitter, and the capability to manipulate the cable core side (network operator area) can be reduced by suitable measures, for example by means
25 of a frame which can be lead-sealed. The separation of the network operator side from the subscriber side allows the competence areas to be separated.

30 The structure of the strip can be seen from the illustrations in Figures 1 to 5. The insulating body of the strip is split in two and, corresponding to the illustration in Figs. 1 to 5, comprises an upper part 3 and a lower part 4. The upper part 3 and the lower part 4 are latched to one another at an angle of 90° via latching openings 10, which are provided on both sides of
35 the strip upper part 3, and latching hooks 37, which are provided on both sides of the strip lower part 4, once the insulating-piercing terminal contact elements 7,8 have been fitted (Figs. 6,8).

The insulating body which is formed by the upper

part 3 and the lower part 4 (housing parts) is designed identically for the formation of different strip functions (terminal, isolating or connecting strip). The different functions of the strips are brought about just
5 by fitting different insulation-piercing terminal contact elements according to Figs. 6 and 8, and by fitting additional peripheral magazines or the like.

In accordance with the illustration in Fig. 1, the terminal strip 1 which is formed in the upper part 3
10 has contact slots 11, and the terminal strip 2 which is formed in the lower part 4 has contact slots 12 which are at an angle of 90° with respect to one another and via which wiring in each case takes place.

The terminal strip 1 forms the distribution side
15 RS for connection of the outgoing wires on the subscriber side, and the terminal strip 2 forms the cable side KS for connection of the incoming wires from the network operator.

Fig. 1 furthermore shows the known means 32,33
20 for cable core routing, and the latching elements 5 for latching the strip onto a mounting bracket 9 (Figs. 10, 11) or onto a profile which is not illustrated. The strips can be arranged in rows as required.

Simply latching the strips onto the mounting
25 bracket 9 saves time-consuming screw tightening work and also offers the capability, if required, for individual strips to be unlocked easily from the mounting bracket 9 with the aid of an unlocking blade which can be folded out of the wiring tool, which is not illustrated.

In accordance with the illustration of the
30 mounting bracket 9 in Figs. 10 and 11, the strips are latched onto the mounting bracket 9 in two positions. Two latch rows 16 and 17 in the side walls 34 of the mounting bracket 9 are shown in Fig. 11. For convenient wiring up
35 of the strip with the incoming cable cores on the cable side KS, the strip is initially moved into its wiring position I (Fig. 11) and, to do this, latched into the latching openings 18 in the latch row 16 by the latching elements 6 (Fig. 2). After this, the strip is detached

and is latched into the final position II by a 90° rotation, with the latching elements 5 (Figs. 1 to 4) latching into the latching opening 19 in the latch row 17 (Fig. 11). The latching of the strip in the final position II can be released only by unlocking the latch using the unlocking blade, while the latching in the wiring position I can be released without any aids. This results in the visually clear distribution panel which is considerably larger than that in the prior art, faces the fitter, and ensures reliable and convenient wiring.

The incorporation of the latching openings 18, 19 in the side walls 34 of the mounting bracket 9 has the advantage that the edges 35 of the side walls 34 are smooth and do not cause any risk of injury while fitting the strip.

In accordance with the illustration in Fig. 10, the mounting bracket 9 has an elongated hole 21 for infinitely variable adjustment of the cable strands or of the blocking plugs, which allows the cable strands to be routed past one another on the rear wall of the mounting bracket 9 without completely loosening the holder.

Fig. 4 shows the plan view of the strip as it is presented to the fitter when the strip is latched onto the mounting bracket 9 in the final position II. The contact slots 11 and 13 face the fitter on the distribution panel side RS, and the contact slots 12 are rotated through 90° with respect to this, on the cable side KS.

In accordance with the section illustration in Fig. 5, the strip is designed as an isolating or contact strip as a result of an isolating contact element 7 being fitted.

The isolating contact element 7 according to Figs. 5 and 6 is formed from a U-shaped insulation-piercing terminal connecting contact 24 having a pick-off contact 25, and from an L-shaped insulation-piercing terminal connecting contact 26 having a pick-off contact 27. The two pick-off contacts 25, 27 form a function pick-off 28 in the plane of the distribution side RS, via which a pick-off 15 of any required function element,

which is not illustrated, is inserted in order to carry out a desired function, for example overvoltage protection. An isolating point 14 can also be designed as a connecting point by the angle 36 in the pick-off contact limb 25 being omitted and the contact limb 25 continuing in a straight line.

The outgoing cable cores of the subscribers are connected to the insulation-piercing terminal connecting contact 24, and the incoming cable cores from the network operator are connected to the insulation-piercing connecting contact 26, which is rotated through 90° with respect to the connecting contact 24.

Fig. 6 shows a plan view of the insulation-piercing terminal contact element 7 (isolating contact).

Fig. 7 shows the section illustration of a strip which is configured with insulation-piercing terminal connecting contacts 8 to form a terminal strip.

The insulation-piercing terminal connecting contact 8 is formed integrally from two insulation-piercing terminal connecting contacts 29, 30, which are arranged at an angle of 90° with respect to one another, and from a function pick-off 31.

The function pick-off 31 and the insulation-piercing terminal connecting contact 29 are accessible from the distribution side RS, and the insulation-piercing terminal connection 30 can be wired up from the cable side KS.

Fig. 8 shows a plan view of the insulation-piercing terminal connecting contact 8, as is used in the strip according to Fig. 7. The insulation-piercing terminal connecting contact 29 is accordingly angled through 45° with respect to the function pick-off 31.

Fig. 9 is a schematic section illustration, showing how the contact elements of a strip which is latched onto the mounting bracket 9 are largely protected against dirt and the formation of condensation by latching an insertion recess 22 onto the mounting bracket 9, and by means of a protective dust cap 23.

L I S T O F R E F E R E N C E S Y M B O L S

1	Terminal strip
2	Terminal strip
3	Upper part (insulating body)
4	Lower part (insulating body)
5	Latching element
6	Latching element
7	Isolating contact
8	Connecting contact
9	Mounting bracket
10	Latching opening
11	Contact slot
12	Contact slot
13	Contact slot
14	Isolating point
15	Pick-off
16	Latch row
17	Latch row
18	Latching opening
19	Latching opening
20	Rear wall
21	Elongated hole
22	Insertion recess
23	Protective dust cap
24	U-shaped contact
25	Pick-off contact
26	L-shaped contact
27	Pick-off contact
28	Function pick-up
29	Insulation-piercing terminal connecting contact
30	Insulation-piercing terminal connecting contact
31	Function pick-off
32	Means
33	Means
34	Side wall

35	Edge
36	Bend
37	Latching hook
RS	Distribution side
KS	Cable side
I	Wiring position
II	Final position



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P A T E N T C L A I M S

1. A terminal, isolating or connecting strip for
5 telecommunications and data technology having contact
 elements and having a retaining device,
 wherein
 contact elements (7,8) are introduced into the two
 insulating bodies (3,4) which are arranged at an angle
10 with respect to one another, which contact elements (7,8)
 are formed over two planes and form two rows of terminal
 strips (1,2) which are at an angle with respect to one
 another, one insulating body (4) having fastening
 elements (5,6).
- 15 2. The terminal, isolating or connecting strip as
 claimed in claim 1, wherein insulation-piercing terminal
 contact elements (7,8) are introduced into the two
 insulating bodies (3,4) which are arranged at an angle
 with respect to one another, which insulation-piercing
20 terminal contact elements (7,8) are formed continuously
 or separately over two planes and form two rows of
 terminal strips (1,2) which are at an angle with respect
 to one another, the lower insulating body (4) having
 latching elements (5,6) for latching onto the mounting
25 apparatus (9) in two latching positions (I,II).
3. The terminal, isolating or connecting strip as
 claimed in claim 2, wherein the mounting apparatus (9) is
 formed by a mounting bracket or a profiled rail.
4. The terminal, isolating or connecting strip as
30 claimed in claim 1, wherein the retaining apparatus (9)
 is formed by a flange to which the strip is screwed.
5. The terminal, isolating or connecting strip as
 claimed in claims 1 and 2, wherein the two insulating
 bodies (3,4) are connected to one another at an angle of
35 preferably 90°.
6. The isolating or connecting strip as claimed in
 claims 1 to 5, wherein the insulation-piercing terminal

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contact elements (7) are formed from a U-shaped insulation-piercing terminal connecting contact (24) having a pick-off contact (25) and from an L-shaped insulation-piercing terminal connecting contact (26) having a further pick-off contact (27), the two pick-off contacts (25,27) forming a function pick-off (28).

7. The connecting strip as claimed in claims 1 to 5, wherein the insulation-piercing terminal contact elements (8) are formed integrally from a function pick-off (31) and from two insulation-piercing terminal connecting contacts (29,30) which are arranged at an angle of 90° with respect to one another.

8. The terminal, isolating or connecting strip as claimed in claim 3, distinguished by a latch row (16) with latching openings (18) for latching the strip on the mounting bracket (9) in a wiring position (I), and a latch row (17) with latching openings (19) for latching the strip on the mounting bracket (9) in a final position (II), the latching openings (18) for the wiring position (I) being arranged laterally offset between the latching openings (19) for the final position (II) of the strip.

9. The terminal, isolating or connecting strip as claimed in claim 3, wherein the mounting bracket (9) has an elongated hole (21) in its rear wall (20) for infinitely variable adjustment of the cable strands and/or of the blocking plugs.

10. The terminal, isolating or connecting strip as claimed in claims 3, 8, 9, wherein the mounting bracket (9) is connected to an insertion recess (22) and to a protective dust cap (23) in order to prevent dirt on the contact elements (7,8).

11. The terminal, isolating or connecting strip as claimed in claims 1 to 10, wherein a frame which can be lead-sealed is provided in order to prevent manipulations on the cable core side (network side).

12. The terminal, isolating or connecting strip as claimed in claim 3, wherein a marking plate, which can be used as an adapter, is provided on the mounting bracket (9) in order to correct the wiring of a strip on the





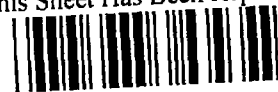
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cable core side (KS).

13. The terminal, isolating or connecting strip as claimed in claims 1 to 12, wherein the strip can be arranged in rows as required.

5 14. A method for wiring cable cores up to the contact elements (7,8) of terminal, isolating or connecting strips, wherein the strip is moved into a wiring position (I) via fastening elements (18,6), is then released, and
10 is moved into a final position (II) by rotation through preferably 90° via further fastening elements (19,5).

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