

PREVIDIA



FIRE DETECTION AND EXTINGUISHANT SYSTEMS

GUIDE TO NETWORKING

inim

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Table of contents

Warranty.....	2
Limited warranty.....	2
Copyright.....	2
Table of contents	3
Chapter 1 General information	5
1.1 Manufacturer's details	5
1.2 About this manual	5
Chapter 2 Introduction to networking	6
2.1 Network connection mode.....	6
Chapter 3 The Hornet+ network	7
3.1 Physical layer	7
3.2 Use of optic fiber connections.....	8
3.3 Supervision of the Hornet+ network	9
3.4 Commissioning of a Hornet+ network.....	9
3.5 Sharing the events on the Hornet+ network.....	11
3.6 Activation of groups of outputs in the Hornet+ network.....	12
Chapter 4 TCP/IP	13
4.1 Physical layer	13
4.2 Limits and precautions.....	13
4.3 Supervision of the TCP/IP network	13
4.4 Commissioning the TCP/IP network	13
4.5 Sharing the events on the TCP/IP network.....	14
4.6 Activations of groups of outputs on the TCP/IP network	14
Chapter 5 Repeater based on TCP/IP	15

Chapter 1

General information

1.1 Manufacturer's details

Manufacturer: INIM ELECTRONICS s.r.l

Production plant: Centobuchi, via Dei Lavoratori 10

Comune: 63076, Montepandone (AP) - Italy

Tel.: +39 0735 705007

Fax: +39 0735 704912

E-mail: info@inim.biz

Web: www.inim.biz

The persons authorized by the manufacturer to repair or replace the parts of this system, hold authorization to work on INIM Electronics brand devices only.

1.2 About this manual

Manual code: DCMNINE0PREVIDIA

Version: 1.20

This manual describes the procedures for the configuration, commissioning and maintenance of the Previdia fire-detection system.

1.2.1 Graphic conventions

Following are the graphic conventions used in this manual.

Conventions	Example	Description
Text in italics	Refer to <i>paragraph 1.2.1 Graphic conventions</i>	Indicates the title of a chapter, section, paragraph, table or figure in this manual or other published reference
<text>	<AccountCode>	Editable field
[Uppercase letter] or [number]	[A] or [1]	Reference relating to a part of the system or video object.

Note:

The notes contain important information relating to the text.

Chapter 2

Introduction to networking

Previdia fire-detection control panels are capable of operating in an interconnected network.

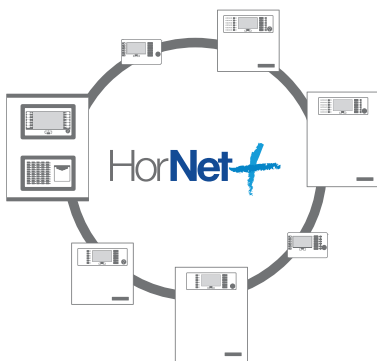
This document describes the interconnection modes, the available functions and also how to start a network of Previdia control panels. For this purpose the term "network node" will be used in reference to each of the control panels connected in the network.

The connection of several control panels in a network allows:

- the exchange of information among the various control panels; viewing, from any node, the events that have occurred on other nodes in the network, or sub-networks defined during system configuration;
- the management of functions among control panels; from any node, credentials permitting, you can operate on each of the control panels in the network (in order to enable, disable, interact with each and every element);
- the sharing of activation groups; it is possible to share the output groups within the network in order to associate activations with conditions detected on various nodes;
- the supervision of the entire network; by connecting to a single node it is possible to supervise the entire network by means of the appropriate supervision software (e.g. supervisory software with graphic maps)
- the configuration of the entire network; by connecting to a single node it is possible to configure the entire network via the appropriate configuration software;
- the maintenance and diagnostics of the entire network; by connecting to a single node it is possible to use the diagnostic and maintenance functions provided by the configuration software.

2.1 Network connection mode

The network connection of Previdia control panels can be achieved in two ways:



Connection via a HORNET+ network

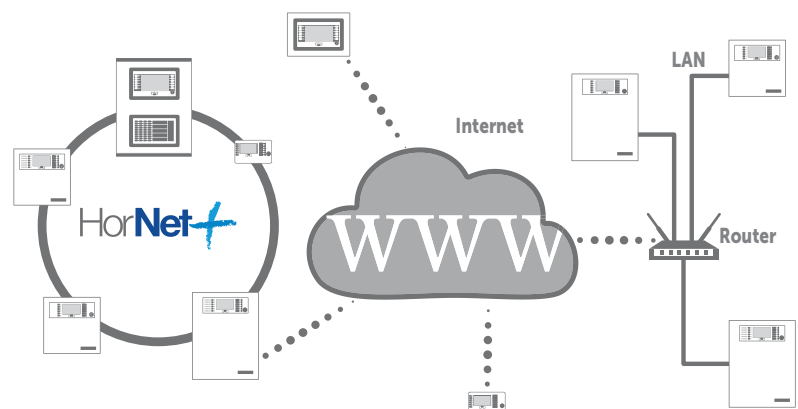
The HorNet+ network is based on an RS485 physical layer (convertible in optical fiber by means of appropriate converters) structured in a ring. This structure allows you to interconnect up to 48 control panels.

A group of control panels interconnected through a HorNet+ network is identified as a "cluster".

Connection based on TCP/IP

Use of an Ethernet connection, based on TCP/IP protocol, as the cluster-interconnect allows you to build up to 20 clusters.

A cluster can be made up of a single Previdia control panel or an FPMCPU module configured as a repeater panel.



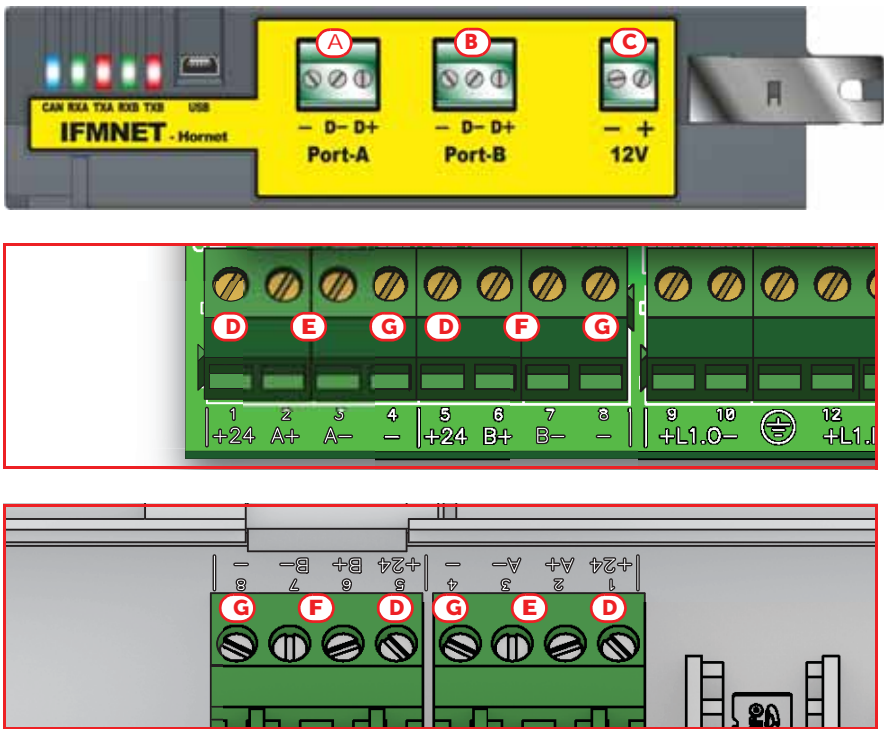
Chapter 3

The Hornet+ network

3.1 Physical layer

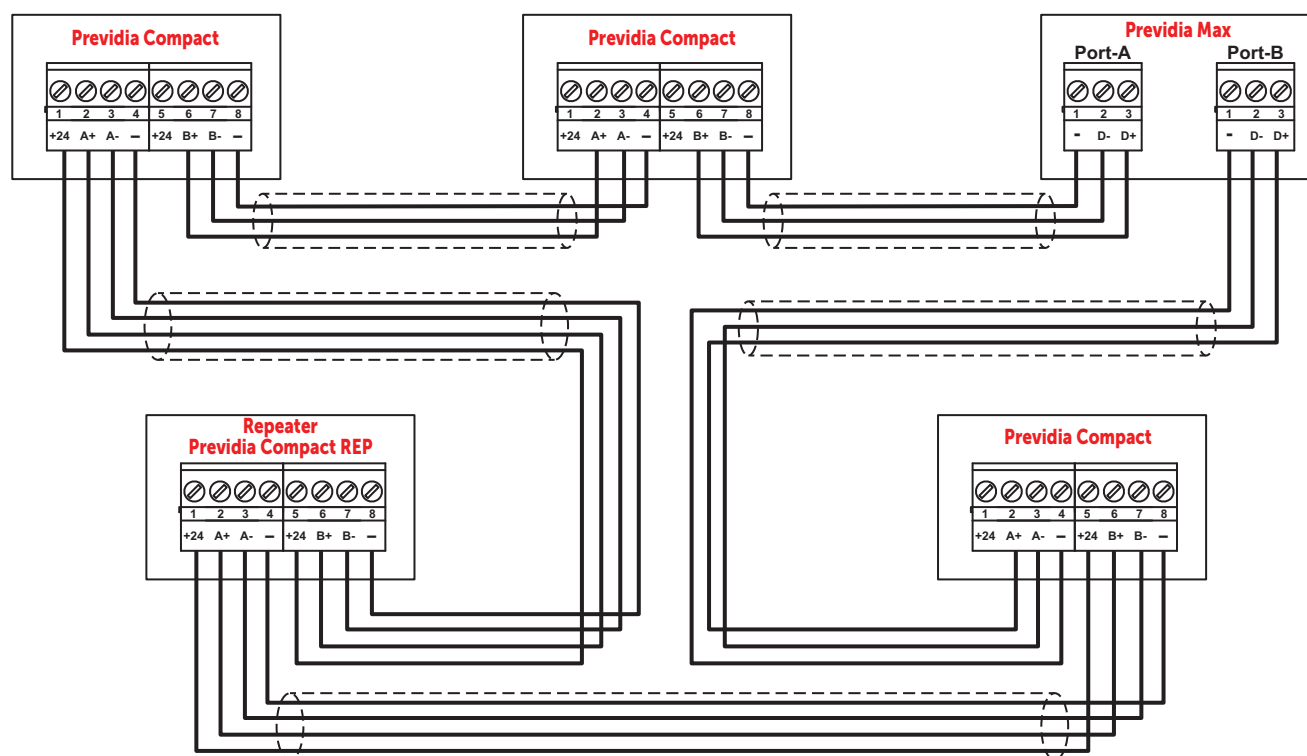
The connection of several control panels in Hornet+ network is based on an RS485 network, which must be structured in ring topology in order to guarantee the appropriate fault tolerance along the cable lines.

Each Previdia Max control panel connected in HORNET+ network must be equipped with an IFMNET module. Previdia Compact control panels and PREVIDIA-C-REP repeaters provide connection terminals on the main board PCB.

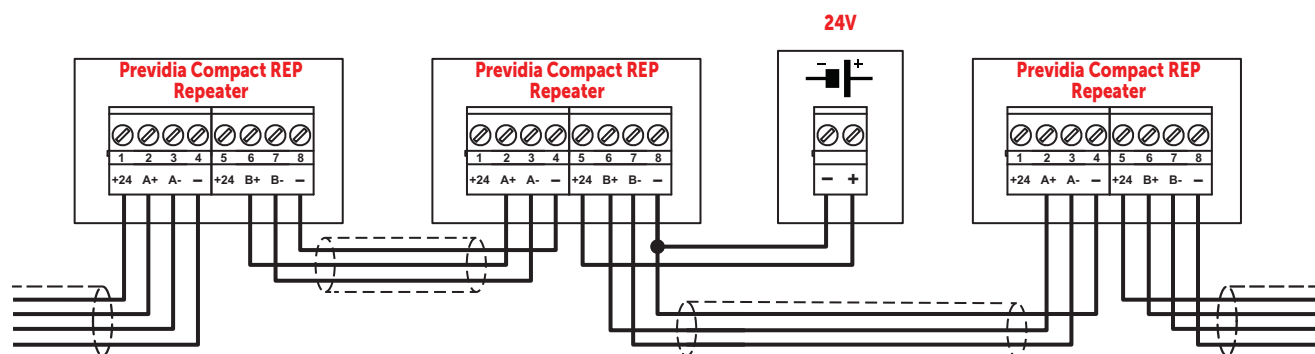


[A]	Port-A	D-, D+	IFMNET	Port A (negative and positive)
		-		Negative
[B]	Port-B	D-, D+		Port B (negative and positive)
		-		Negative
[C]	12V	-, +		Terminals for the power supply to the RS485/fiber converter
[D]	1, 5	+24	Previdia Compact PREVIDIA-C-REP	Positive
[E]	2, 3	A+, A-		Port A (positive and negative)
[F]	6, 7	B+, B-		Port B (positive and negative)
[G]	4, 8	-		Negative

Cables: 2 wires shielded cable for Previdia Max and 4 wires shielded cable for Previdia Compact
Typical impedance 120ohm
Maximum length 1000m (between two successive control panels, see *paragrafo 3.4*, point 2)
Compliant with local laws and regulations in force

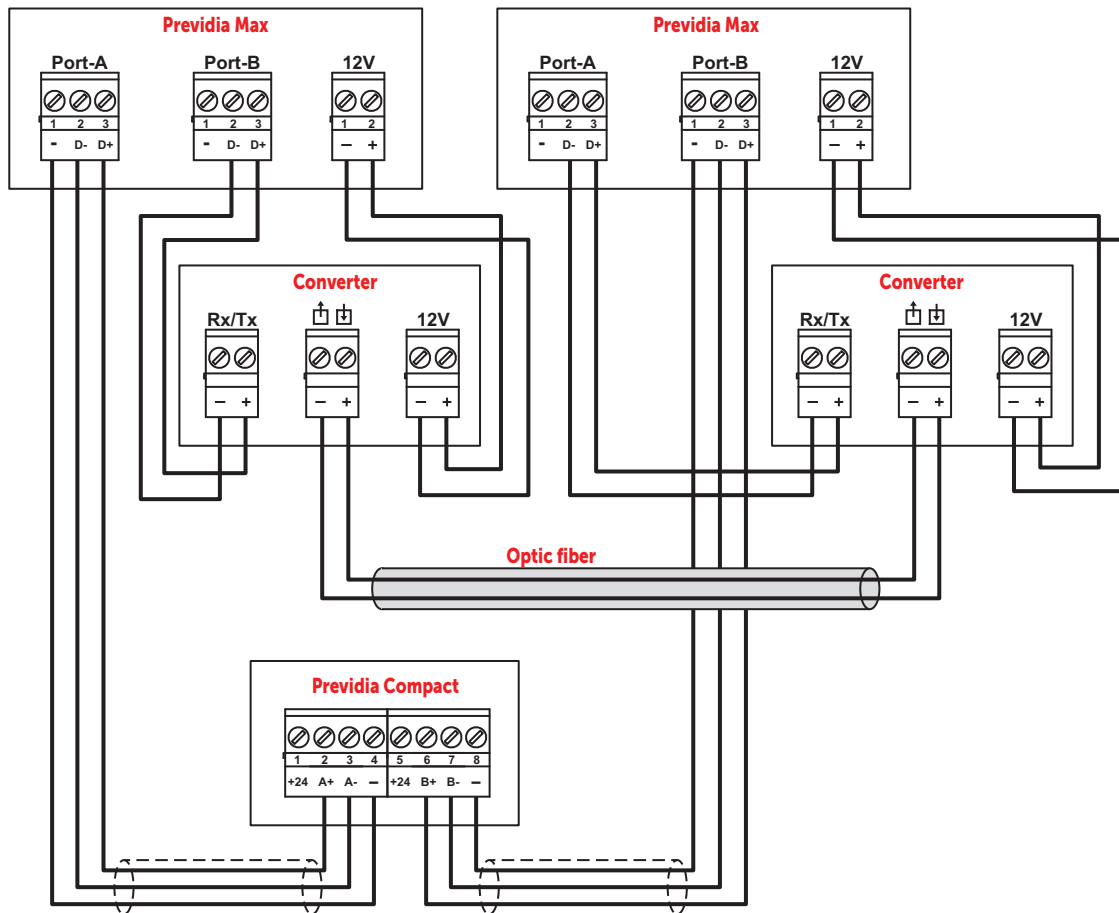


Note: It is necessary to use an external power supply for the PREVIDIA-C-REP repeater if there are 3 or more repeaters in series, as the power supply is not distributed from port A to B and vice versa.



3.2 Use of optic fiber connections

The connection of the various nodes in the HORNET+ network can be achieved through optic fiber using the appropriate converters, as in the following example.



In cases where a fiber optic cable is used over long BUS lengths, it is necessary to use a RS485/fiber converter (non-INIM brand product). The module IFMNET has a 12V output (*paragraph 3.1 - [C]*) for the power supply to the converter in use.

3.3 Supervision of the Hornet+ network

Once the Hornet+ network is configured, in the event of interruption of a single connection, each node will signal the fault but the network will continue to function, albeit at a reduced speed.

In the event of a lost node (complete shutdown or fault on the IFMNET module) all the other nodes in the network will signal the fault.

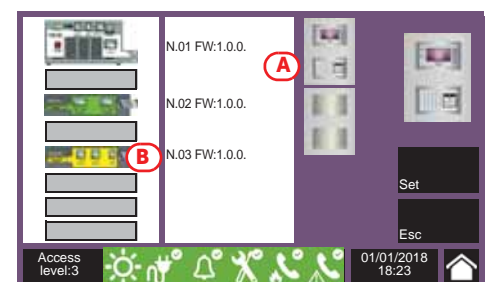
3.4 Commissioning of a Hornet+ network

Once several control panels have been connected in a Hornet+ network, as indicated in the diagrams shown in the previous paragraphs, it will be necessary to work through the following points.

1. Supply power to each node in the network.
2. Configure each node in the cluster.

for Previdia Max: Access the programming phase of the control panel and then press the **Configuration** button on the menu on the screen. Alternatively, it is possible to tap directly on the configuration status icon. Entry of a valid access code is necessary In both cases.

Once the configuration menu has been accessed, the control panel screen will provide a layout of the control panel and its parts (*[A]*).
Select the IFMNET module (*[B]*).



for **Previdia Compact**: Access to control panel programming and press the **Configuration** button.
In the configuration section, touch the net-working programming access icon.

for **PREVIDIA-C-REP**: Access to repeater programming and press the **Configuration** button.
In the configuration section, touch the repeater programming access icon.

- 2.1 Set the communication speed to be used by the Hornet+ network.

The diagram at the side shows the theoretical maximum distances reachable with an RS485 based on the communication baud rate/speed.

The data refers to an ideal communication achieved through a perfectly adapted line.

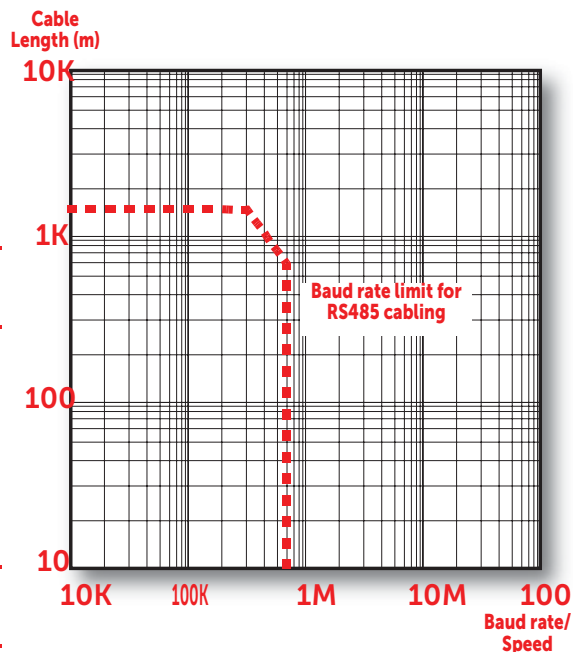
Note: *The set communication speed must be the same for all nodes in the same Hornet+ cluster).*

- 2.2 Assign a univocal address to each node in the cluster.

The valid addresses are from 1 to 48. Address "0" is equivalent to the disconnection of the control panel from the network.

- 2.3 Set the network "gateway" control panel by means of the appropriate option.

Note: *Only one point can be set as the gateway to a Hornet+ network.*



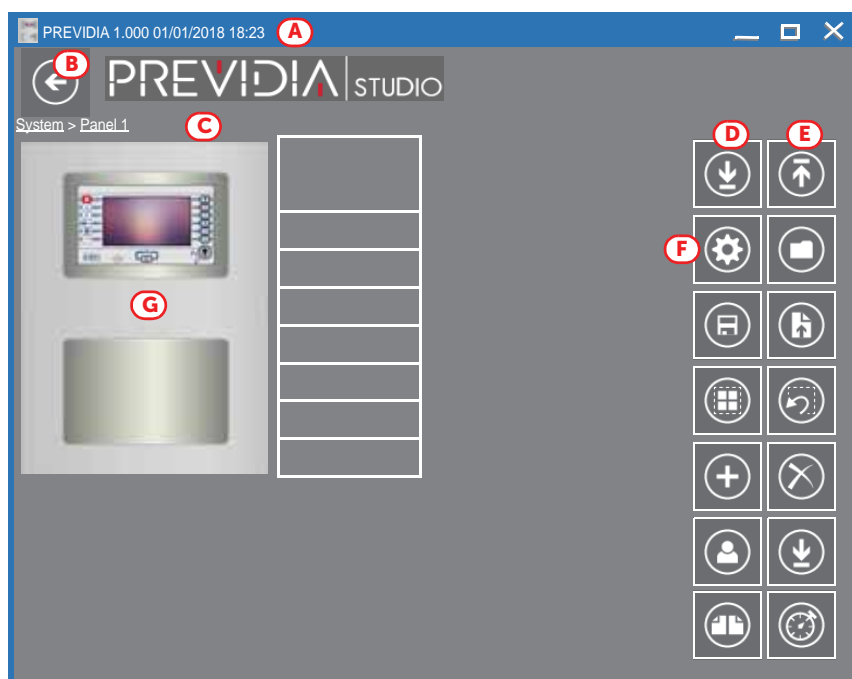
When a Hornet+ address is assigned to a Previdia Max control panel, the IFMNET module activates the blue LED to indicate that the control panel is in the cluster and has started to communicate with the other control panels. The LEDs on the IFMNET module indicate activity on the two communication channels.

3. From a PC running the Previdia/Studio configuration software, you must read the network configuration in order to have the consistent data on the PC and thus proceed with the configuration in accordance with the needs of the installation

- 3.1 Start the Previdia/Studio configuration software.

The interface of the Previdia/Studio software is presented in the following way:

[A]	Software revision, current date and time
[B]	Button to go up to the system layer
[C]	Layer
[D]	Read button
[E]	Write button
[F]	Settings button
[G]	Control panel image



3.2 Click-on the **Settings** button (*[F]*).

In the window that opens, select the communication channel to be used for access to the control panel of the cluster the PC is connected to (SERIAL), or to the control panel connected to the Ethernet network intended for use as the access point to the entire cluster (IP).

- **IP** - if selected, you must enter the IP address and the port of the control panel. There is also a button that launches a test on the set channel and parameters.
- **SERIAL** - if selected, you must select the serial port used.

3.3 Navigate to the visualization of the system at network layer using the appropriate button (*[B]*).

3.4 Click-on the **Read** button (*[D]*) to read the system configuration. Once the Read procedure ends, the entire control-panel network will be shown.

The control panel the PC connected to for the read operation, and to which the "gateway" functions are assigned, will be identified by the symbol here at the side. The control panel with this function is the one that allows the interconnection with any other clusters via IP.

3.5 At this point it is possible to select each control panel, edit the parameters and rewrite the edited configuration on the system by means of the **Write** button (*[E]*).

3.5 Sharing the events on the Hornet+ network

It is possible to define which events from other control panels are to be displayed for each node of the Hornet+ network.

This is possible with the Previdia/Studio software by duly configuring the **Events filter** section. This section allows you to program up to 5 events filters.

The access is allowed by the Previdio/Studio solution, after the selection of the control panel inside the Hornet+ network.

for Previdia Max: The **Events filter** section is available in the FPMCPU frontal module programming section, by means of the appropriate button.

for Previdia Compact: The **Events filter** section is available in the control panel main programming section, by means of the appropriate button.

for PREVIDIA-C-REP: The **Events filter** section is available in the repeater main programming section, by means of the appropriate button.

[A]	Filters selection programming field
[B]	Button to change the priority of the events
[C]	Category of event factors
[D]	Buttons to enable all the factors of the corresponding category

Each event is defined by 4 categories of factors by which it is characterized:

- cluster group

- control panel in the Hornet+ network
- zone of origin
- label (type)

In order to setup a filter, after selecting it, you must first indicate its composing events, by enabling the factors that characterize it, that is the type and origin.

The events coming from the network are acknowledged and shown on the display only when they satisfy all the enabled factors of at least one of the 5 filters.

The control panel self-configures at filter n°0. This setting accepts any event, from any zone, belonging to any control panel of any cluster, therefore, such a filter accepts all events from the entire network.

3.6 Activation of groups of outputs in the Hornet+ network

The Hornet+ system allows the activation of outputs connected to a specific network node when certain conditions are verified on other nodes.

The configuration of these activations is possible through the appropriate programming of the groups of outputs. Each of the 240 groups of each control panel can be configured as: "Hornet+ group".

This is possible with the Previdia/Studio software by duly configuring the **Outputs group** section.



The access is allowed by the Previdio/Studio solution, after the selection of the centrol panel inside the Hornet+ network.

for Previdia Max: The **Outputs group** section is available in the FPMCPU frontal module programming section, by means of the appropriate button.

for Previdia Compact:The **Outputs group** section is available in the control panel main programming section, by means of the appropriate button.

[A]	List of groups of outputs
[B]	Programming parameters of the selected group
[C]]List of devices that activate the selected group
[D]	List of devices activated by the selected group

Once the **Hornet+ group** option is activated, in the parameters section of the selected group ([B]), the group will be the same for all the control panels in Hornet+ network. The outputs associated with the group will activate regardless of control panel they are connected to. In the same way, the devices of any network control panel can activate the shared group.

If you enable the **Hornet+ group** option on a network control panel, the software will ask if you want to share the group with all the control panels in the network. If your answer is affirmative, the software will automatically enable the option on all the control panels in network and on the selected group.

Chapter 4

TCP/IP

4.1 Physical layer

To interconnect several clusters together via TCP/IP protocol, it is necessary that at least one control panel is connected to the Ethernet network.

This control panel will be indicated as the "gateway" of the cluster and will manage information sharing among the clusters, as well as the supervision of the TCP/IP network integrity. The icon of this control panel will show the symbol here at the side.



If instead the icon of a control panel acquires the symbol here beside, it means it is connected to the network with its own IP address.



4.2 Limits and precautions

The connection of several clusters via the Ethernet network is based on hardware that is not supplied by INIM Electronics. Therefore, if the connection in the network is based on TCP/IP, it is the sole responsibility of the project manager who designs the installation to evaluate the use made of it (supervision, display of cross events, cross activations, etc.). Therefore, it is necessary to define the eventual characteristics of the Ethernet network, introducing, where appropriate, switches capable of managing dual paths with automatic fault recovery capacity, wiring with different paths, and to take all the necessary precautions to ensure that the Ethernet physical layer provides fully secure and redundant capabilities.

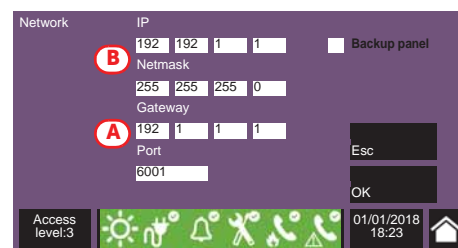
4.3 Supervision of the TCP/IP network

Once the TCP/IP network has been configured, if connectivity to a cluster is lost (complete shutdown or FPMCPU module fault) all the remaining nodes in the network will signal the fault.

4.4 Commissioning the TCP/IP network

For the configuration of a control panel network based on TCP/IP protocol, proceed in accordance with the following points:

1. On each cluster of control panels perform the Hornet+ network setup operation (where present) as described in the previous chapter.
2. Make sure that each cluster is equipped with an FPMCPU module or a Previdia Compact control panel connected to the Ethernet network. If more than one control panel per cluster is connected to the Ethernet network, it is necessary to select the one that will serve as the gateway to the cluster ([A]). In such cases you must make a note of the IP addresses of each gateway.
3. Ensure that the IP address of each control panel and its net mask ([B]) are configured in such a way that they belong to the same class of addresses as the others.
4. Using a PC, running the Previdia/Studio configuration software, connected to the same Ethernet network and configured with a netmask consistent with the control panels, click-on the **Settings** button.



5. Select "IP" as the communication channel and enter the address of the first gateway on the list ([C]).
6. By means of the **Check connection** button ([D]) it is possible to test the communication in order to verify that the TCP/IP parameters are configured correctly.

7. Go up through the Previdia installation until you reach the highest layer, by means of the button on the top-right of the window (paragraph 3.4 - [B]).
8. Click-on the **Add** button to add a new cluster. The software will show the new cluster, comprising a single control panel, added to those already configured. Repeat the operation for each cluster that you intend adding to the network.
9. For each added cluster, enter the IP address as follows:
 - 9.1 Double click-on the control panel of the cluster.
 - 9.2 When you reach the control panel layer click-on the **Settings** button.
 - 9.3 In the window that opens, select "IP" and enter the address.
 - 9.4 Check the communication capacity by means of the **Check connection** button ([D]).
 - 9.5 Return to the "System" layer and proceed in the same way for the successive clusters.
10. Once the address has been assigned and the communication capacity tested on the gateway of each cluster, proceed with the read operation by going up to the System layer and clicking-on the **Read** button.

The read operation can be simplified by indicating to the software which cluster to read, by means of the appropriate option from the **Settings** window, selected on the "System" layer ([E]).

Once the read operation terminates (this operation may take several minutes depending on the size of the system), the software will show the clusters complete with all their components. At this point the software will have read all the elements of the network and will contain the actual data of each control panel.

However, warning icons will be shown to indicate that it is necessary to perform a write operation in order to communicate to each component in the network the existence of all the other elements.

11. To set the programming of the entire installation click-on the **Write** button. This operation may take quite some time due to the quantity of data that has to be transferred for each single control panel.

If you intend to write only the networking settings, you must first double click-on the network icon. In this way you will access the **Network configuration** section, where you can click-on the **Write** button.

4.5 Sharing the events on the TCP/IP network

By appropriately configuring the **Events filter** section as described in paragraph 3.5 *Sharing the events on the Hornet+ network*, it is possible to define which events coming from other control panels are to be visualized for each node in the network. Please refer to the said paragraph for instructions.

4.6 Activations of groups of outputs on the TCP/IP network

The Previdia allows the activation of outputs connected to a specific node in the TCP/IP network when verified conditions on other nodes occur.

The configuration of these activations is possible through the appropriate programming of the groups of outputs. Each of the first 240 groups of each control panel can be configured as "Cluster group".

The option required is reachable via the programming section of the FPMCPU frontplate module, by accessing the **"Outputs group"** section by means of the appropriate button and following the indications in the paragraph 3.6 *Activation of groups of outputs in the Hornet+ network*.

Once the **Cluster group** option is enabled, available in the parameters section of the selected group, the group programmed in this way will be the same for all the control panels connected in the TCP/IP network. The outputs associated with the group will activate regardless of control panel they are connected to. In the same way, the devices of any network control panel can activate the shared group.

Chapter 5

Repeater based on TCP/IP

If you intend to configure a Previdia control-panel repeater on a TCP/IP network, it is necessary to have an FPMCPU module for Previdia Max and a PREVIDIA-C-REP module for both Previdia Compact and Previdia Max.

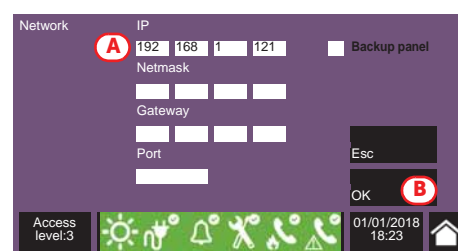
After proper installation of the module, you must connect the Ethernet cable then proceed with the configuration process, first via the repeater touch screen then, successively, via the Previdia/Studio programming software.

Via the display

First of all you must assign an IP address to the repeater:

1. Press the **Programming** button on the home page of the display and enter an access code valid for level 3 (code "00004" at default)
2. Access the **Network** section and assign a valid IP address ([A], 192.168.1.121 at default).
3. Press the **OK** button [B] to exit and save.

After doing so, it is necessary to check that the address of the repeater is "0". To do this it is necessary to access the **Programming** section, as indicated above, then access the **Configuration** section.



The configuration process continues through the control pane programming software.

Via Previdia/Studio

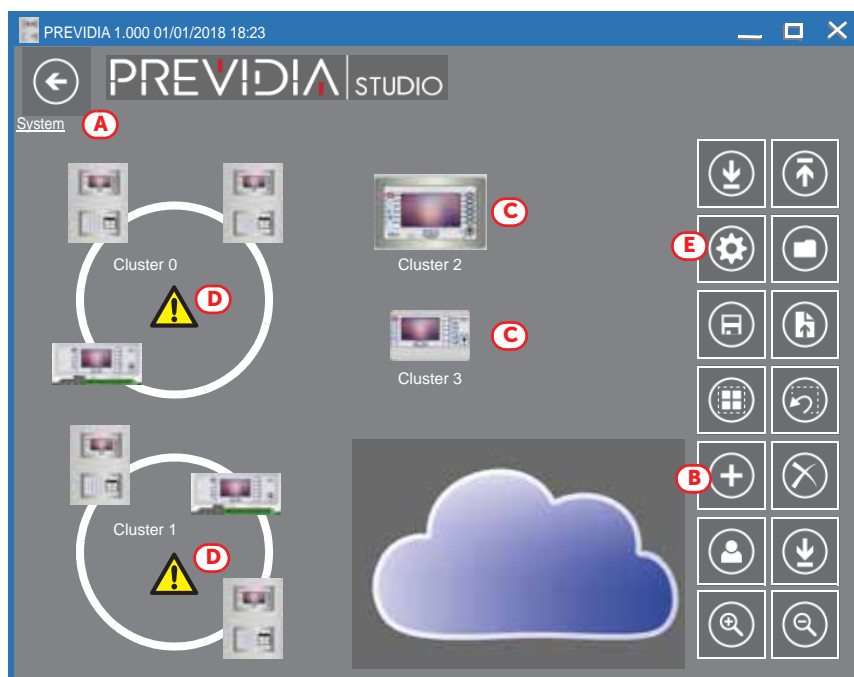
To configure an IP repeater, it is necessary to start from a solution that already exists.

1. Go up to the "System" section [A] and click-on the **Add** button [B].
2. On the window that opens, double click-on the repeater icon. The repeater will be added at the side of the first cluster in the top part of the section [C].

The warning icons [D] inside clusters 1 and 2 indicate that it is necessary to perform a write operation in order to communicate to each component in the network the existence of the other elements.

Therefore, you must select the type of communication connection with the repeater.

3. Click-on the icon of the repeater [C] and then on the Settings button [E]. The respective window will open.



4. Select "IP" as the communication channel and enter the IP address of the repeater and the communication port (6001) [F]..
5. The **Check connection** button [G] will allow you to test the communication and verify that the TCP/IP network parameter are configured correctly.

At this point you must associate the repeater with a control panel.

6. Access the repeater programming screen by double clicking-on the respective icon and perform a read operation using the **Read** button [H].
7. Select, in the respective programming fields [I], the cluster and the control panel you want to associate the repeater with.
8. Using the [J] button, return to the "System" section. You will note that the icon of the repeater is positioned at the side the cluster it is associated with.

9. Access the "Network Configuration" section by double clicking-on the icon in the centre of the window.



10. In the clusters list on the left [K], the "Gateway not defined" message will be shown in the field corresponding to the repeater being configured. Click on the "Gateway not defined" message to open a dropdown menu where you can select an IP address for the repeater.
11. In the same list, first click-on the cluster the repeater is associated with [L] and then on the relative control panel underneath [M].
12. In the column on the right, in the row of the cluster the repeater is associated with [N], check that the cluster and the control panel (you want to associate the repeater with) are correct.
13. Click-on the **Write** button [O].

N.	Label	IP	Cluster	Panel
00	Cluster 1	10,106,107,111	00	00
01	Cluster 1	10,106,107,111	01	01
03	Cluster 1	10,106,107,111	03	03
04	Cluster 1	10,106,107,111	04	04
05	Cluster 1	10,106,107,111	05	05

If everything is correct, all the control panels in the network and their relative IP repeaters will go into programming status.



Evolving Security

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Inim Electronics S.r.l.

Centobuchi, via Dei Lavoratori 10
63076 Montepandone (AP), Italy
Tel. +39 0735 705007 _ Fax +39 0735 704912

info@inim.biz _ www.inim.biz



DCMNINE0PREVIDIA-120-20211008