COMBICONTROL

C6

GB **Instruction Manual** **ROUTER**

Original Manual		
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KEB

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SECTION **1**

Preliminary Information

1.1 General notes

a) The information in this manual is subject to change and is in no way binding upon Karl E. Brinkmann GmbH (KEB).
b) KEB is not responsible for technical errors or other omissions in the manual, and shall not accept any responsibility deriving from its use.

1.2 Trademarks

a) All brands and product names mentioned in this manual are trademarks of their respective owners.

1.3 Instructions on disposal

IT

- Il simbolo sul prodotto o sulla confezione indica che il prodotto non deve essere considerato come un normale rifiuto domestico, ma deve essere portato nel punto di raccolta appropriato per il riciclaggio di apparecchiature elettriche ed elettroniche. Provvedendo a smaltire questo prodotto in modo appropriato, si contribuisce a evitare potenziali conseguenze negative per l'ambiente e la salute, che potrebbero derivare da uno smaltimento inadeguato del prodotto. Per informazioni più dettagliate sul riciclaggio di questo prodotto, contattare l'ufficio comunale, il servizio locale di smaltimento rifiuti o il fornitore da cui è stato acquistato il prodotto.

EN

- The symbol on the product or in its packaging indicates that this product may not be treated as household waste. Instead it shall be handed over the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the supplier where you purchased the product.

FR

- Le symbole sur le produit ou son emballage indique que ce produit ne peut être traitè comme décher ménager. It doit être remis au point de collecte dèdié à cet effect (collect et recyclage du matèriel èlectrique et èlectronique). En procèdant à la mise à la casse règlementaire de l'appareil, nous prèservons l'environnement et notre sécurité, s'assurant ainsi que les dèchets seront traitès dans des conditions appropriées. Pour obtenir plus de dètails sur le recyclage de ce produit, veuillez prendre contact avec les services de votre commune ou le distributeur où vous avez effectué l'achat.

DE

- Das Symbol auf dem Produkt oder seiner Verpackung weist darauf hin, dass dieses Produkt nicht als normaler Haushaltsabfall zu behandeln ist, sondern an einem Sammelpunkt für das Recycling von elektrischen und elektronischen Geräten abgegeben werden muss. Durch ihren Beitrag zum korrekten Entsorgen dieses Produkts schützen Sie die Umwelt und die Gesundheit Ihrer Mitmenschen. Umwelt und Gesundheit werden durch falsches Entsorgen gefährdet. Weitere Informationen über das Recycling dieses Produkts erhalten Sie von Ihrem Rathaus, Ihrer Müllabfuhr oder den Distributoren, in dem Sie das Produkt gekauft haben.

ES

- El simbolo en el producto o en su embalaje indica que este producto no se puede tratar como desperdicios normales del hogar. Este producto se debe entregar al punto de recolección de equipos eléctricos y electrónicos para reciclaje. Al asegurarse de que este producto se deseche correctamente, usted ayudará a evitar posibles consequencias negativas para el ambiente y la salud pública, lo qual podria ocurrir si este producto no se manípula de forma adecuada. Para obtener informaciónes mas detalladas sobre el reciclaje de este producto, póngase en contacto con la adMinistraciòn de su ciudad, con su servicio de desechos del hogar o con el surtidor donde comprò el producto.

PT

- simbolo no produto ou na embalagem indica que este producto não pode ser tratado como lixo doméstico. Em vez disso, deve ser entregueado ao centro de recolha selectiva para a reciclagem de equipamento electrico e electronico. Ao garantir uma eliminação adequada deste produto, ira ajudar a evitar eventuais consequencjas negativas para o meio ambiente e para a saude publica, que, de outra forma, poderiam ser provocadas por un tratamento incorrecto do produto. Para obtener informações mais detalhadas sobre a reciclagem deste produto, contacte os serviços municipalizados locais, o centro de recolha selectiva da sua area de residência ou no distribuidor onde adquirir ou produto.

1.4 Description of safety symbols

Danger	This symbol indicates a danger to life or health of personnel.
Attention	This symbol indicates a danger to the hardware and / or the environment.
Note	This symbol indicates an additional information meant to provide a better understanding.

1.5 Qualified Personnel

a) COMBIVIS connect Router device may be operated only by personnel qualified for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions.
b) Qualified personnel are those who, based on their training and experience, are able to identify risks and avoid potential hazards when working with these systems.

1.6 Basic knowledge required

a) To understand operating instructions a general knowledge of automation technology is needed.
b) Knowledge of personal computers and the Microsoft operating system is required to understand this user's guide.

1.7 Proper use of the product

a) KEB products may only be used for the applications described in the catalogue and in the technical documentation.
b) If products and components from other manufacturers are used, these must be approved by KEB.
c) Proper transport, assembly, installation, storage, commissioning, operation and maintenance are required to ensure that the product operates safely.
d) The indicated environmental conditions must be observed.
e) The information in this user's manual must be observed.

1.8 Purpose of the user's guide

a) This user's manual contains information based on the requirements defined by DIN EN 62079 for mechanical engineering documentation.
b) These operating instructions are intended for:
    1. Users.
    2. Commissioning engineers.
    3. Maintenance personnel.
c) Pay attention at the information in the chapter "Safety instructions".
d) More information such as operating instructions, examples and reference information, are available in the online help of Control Center (minimum version required is 2)

1.9 The manual is a part of the system

a) This user's guide belongs to COMBIVIS connect Router device and is also required for commissioning.
b) Keep all supplied documentation for the entire service life of C6 ROUTER E1.

1.10 Figures

a) This manual contains illustrations of the described devices.
b) Some details of the illustrations may differ from the device provided.

1.11 Scope of the operating instructions

a) The operating instructions describe how to install, connect and setup the E/M family devices and the COMBIVIS connect runtime (in the following 'COMBIVIS connect Router device').
The devices are the following:

C6 ROUTER E1	Device for remote assistance by cabled network
C6 ROUTER E1 ET*	Device for remote assistance via wired network with extended temperature range
C6 ROUTER M1	Device for remote assistance by mobile network
C6 ROUTER M1 ET*	Device for remote assistance by mobile network with extended temperature range
C6 ROUTER E2	Device for remote assistance and data monitoring via wired network
C6 ROUTER E2 ET*	Device for remote assistance and data monitoring via wired network with extended temperature range
C6 ROUTER M2	Device for remote assistance and data monitoring by mobile network
C6 ROUTER M2 ET*	Device for remote assistance and data monitoring by mobile network with extended temperature range

(ET* = Extended Temperature)

1.12 Safety instructions

1.12.1 Installation according to the instructions

- Commissioning the COMBIVIS connect Router device is prohibited until it has been absolutely ensured that the system in which the COMBIVIS connect Router device is to be installed complies with all the applicable EU and international regulation.

1.12.2 Hazardous areas

- Do not use COMBIVIS connect Router device in hazardous areas.

1.12.3 Working on the control cabinet

- **Open equipment**
  The COMBIVIS connect Router device is open equipment. This means that the COMBIVIS connect Router device may only be integrated in housings or cabinets, where it can be operated from the front panel. The cabinet in which COMBIVIS connect Router device is installed may only be accessed with a key or tool and only by trained and authorized personnel.
- **Dangerous voltage**
  Opening the cabinet may expose high voltage parts. Before opening the cabinet always disconnect the power.

1.13 Notes about usage

- COMBIVIS connect Router devices are approved for indoor use only.
- COMBIVIS connect Router devices may be damaged if operated outdoors.

1.14 Applicable standard

Please refer to section 6 for details about the relevant standards.

SECTION **2**

Description

2.1 Product description

COMBIVIS connect Router is a hardware device able to provide the remote assistance services as a standalone solution, allowing to use COMBIVIS connect in all those situations where for any reason the software solution is not an option. COMBIVIS connect Router device applies to the automation network with zero impact on the actual devices. No changes are requested to the configuration of any of the existing devices.
COMBIVIS Connect Router implements a specific variant of COMBIVIS Connect Runtime; from the functional point of view this is equivalent to the standard Runtime

2.2 Key features

- KEB COMBIVIS connect Router runtime on Microsoft Windows Embedded Compact 7.
- Full compatibility with standard COMBIVIS connect software functions (see COMBIVIS connect Control Center online manual for further information).
- ARM Cortex A8 processor (1,0 GHz, 800MHz for ET version).
- 512MB RAM DDR3-800
- 2/4GB eMMC memory, file system organization for data storage
- Ethernet interface 10/100 Mbps WAN for Internet connection.
- Ethernet interface 100 Mbps LAN for the automation network.
- 2G/3G/3G+ modem for WAN mobile network connection (C6 ROUTER M1 and C6 ROUTER M2 models)
- RS-232/RS-485/RS-422 Optical isolated serial port with MPI support up to 187 Kbit/s.
- USB 2.0 interface for system configuration and updates.
- Front panel LEDs for device status and operation report.
- 24 VDC Digital input to control COMBIVIS connect Router device WAN connection activation.
- 24 VDC Digital input for COMBIVIS connect Router device software reset.
- Digital output to report the status of the WAN connection to the COMBIVIS connect Server Infrastructure.
- Digital output to report remote the presence of a Control Center connection (Remote assistance service running)
- Magnetic Stainless steel case.
- DIN rail book mounting and wall book mounting.
- Protection Rating: IP 20
- Four models with different features:
    - C6 ROUTER E1 systems support standard remote assistance features
    - C6 ROUTER M1 systems provide remote assistance features with additional integrated 2G/3G/3G+ modem for internet connectivity
    - C6 ROUTER E2 systems combine standard remote assistance with data monitoring functions including data logging, alarms notification and web HMI
    - C6 ROUTER M2 systems combine standard remote assistance with data monitoring functions including data logging, alarms notification, web HMI with additional integrated 2G/3G/3G+ modem for internet connectivity and SMS notification

2.3 Package

COMBIVIS connect Router device package consists of:

E/M system	C6 ROUTER E1 C6 ROUTER E2 C6 ROUTER M1 C6 ROUTER M2
User's guide CD	
DIN mount kit (**mounted**)	
Wall mount kit	
n.1 Power supply plug	
n.1 Isolated IO plug	
Pentaband Stilo Antenna (optional)	
Pentaband Outdor Antenna (optional)	
Pentaband Wall mount Antenna (optional)	
Antenna cable extension 3 / 5 m(optional)	

Table 1 Package

2.4 Front view C6 ROUTER E1

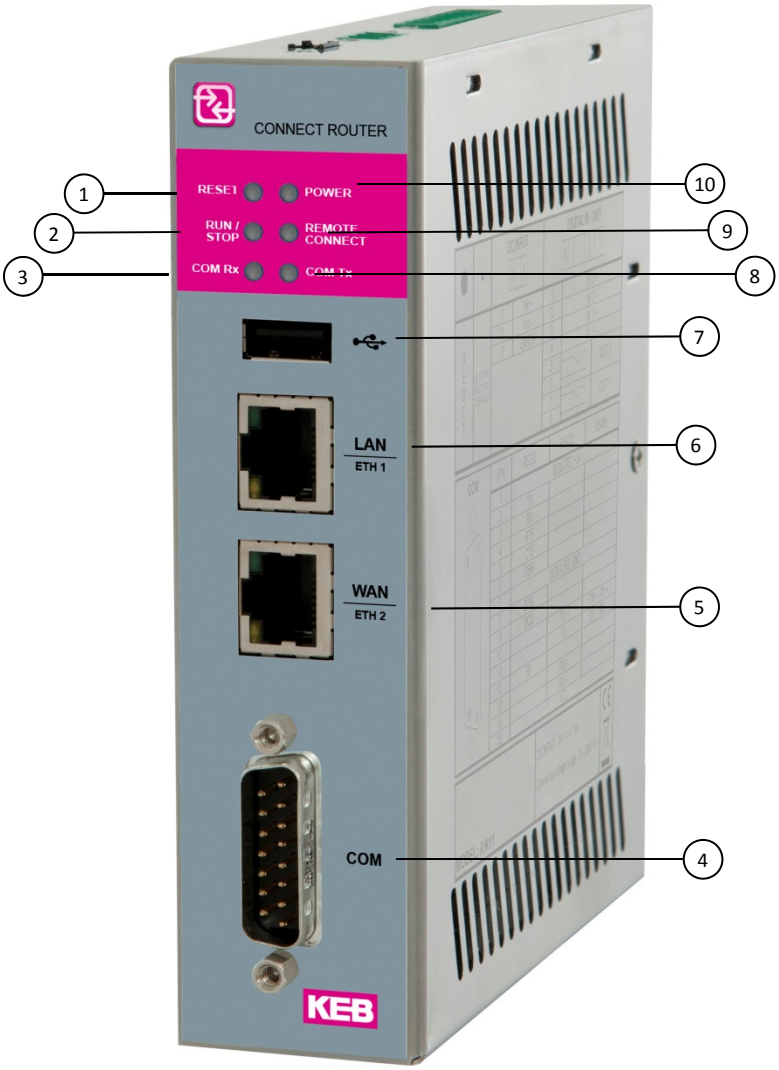


Figure 1
C6 ROUTER E1

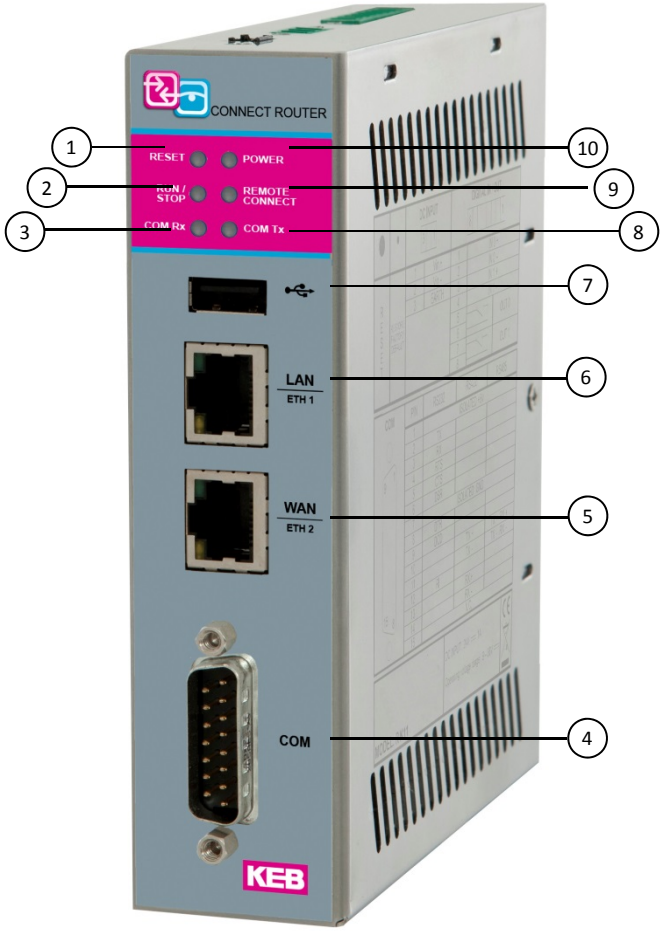
1. Reset LED (Yellow)
2. Run /Stop LED (Green/Red)
3. COM Rx LED
4. COM
5. WAN ETH2
6. LAN ETH1
7. USB
8. COM Tx LED (Green)
9. Remote Connection LED (Green)
10. Power LED (Green)

The following behaviors are defined:

- **Steady lighted**
- **Blinking**
- **Continuous sequence** of a blink codes with a short pause in between to report a **status**
- **Single sequence** of a blink code to report an **event**

LED	Status	Description
RESET	Steady lighted	Active when pressing the RESET button or when in presence of a not recoverable hardware fault.
POWER	Steady lighted	Active when the COMBIVIS connect Router device is properly powered
RUN/STOP	Steady Green	COMBIVIS connect started and connected to the server
	Steady Red	COMBIVIS connect started but NOT connected to the server
	Blinking Green	COMBIVIS connect started and connecting to the server
	Blinking Red	COMBIVIS connect started but not connected to the server because not associated to any Domain
	Sequence of 2 red blinks	connection attempt to a different domain than the first of the initial registration
	Single 2 green blinks	Configuration from USB stick successfully completed
	Single 2 red blinks	User credential for Domain access not valid
	Single 3 green blinks	COMBIVIS connect Router device update from USB stick successfully completed
	Single 3 red blinks	COMBIVIS connect Router device updated from USB Stick failed
	Single 4 red blinks	Factory restore started
	Single 5 red blinks	COMBIVIS connect Runtime execution error, will follow a system restart
	Single 6 red blinks	USB stick data format not correct or unknown error
REMOTE CONNECTION	Steady lighted	Active when at least one Control Center client is connected to the C6 ROUTER E1, otherwise off
COM Rx COM Tx	Signal presence	These LEDs are directly connected to the serial port Rx/Tx signals and they show traffic through the lines

2.5 Front view C6 ROUTER E2



1. Reset LED (Yellow)
2. Run /Stop LED (Green/Red)
3. COM Rx LED
4. COM
5. WAN ETH2
6. LAN ETH1
7. USB
8. COM Tx LED (Green)
9. Remote Connection LED (Green)
10. Power LED (Green)

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- **Steady lighted**
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- **Continuous sequence** of a blink codes with a short pause in between to report a **status**
- **Single sequence** of a blink code to report an **event**

LED	Status	Description
RESET	Steady lighted	Active when pressing the RESET button or when in presence of a not recoverable hardware fault.
POWER	Steady lighted	Active when the COMBIVIS connect Router device is properly powered
RUN/STOP	Steady Green	COMBIVIS connect started and connected to the server
	Steady Red	COMBIVIS connect started but NOT connected to the server
	Blinking Green	COMBIVIS connect started and connecting to the server
	Blinking Red	COMBIVIS connect started but not connected to the server because not associated to any Domain
	Sequence of 2 red blinks	connection attempt to a different domain than the first of the initial registration
	Single 2 green blinks	Configuration from USB stick successfully completed
	Single 2 red blinks	User credential for Domain access not valid
	Single 3 green blinks	COMBIVIS connect Router device update from USB stick successfully completed
	Single 3 red blinks	COMBIVIS connect Router device updated from USB Stick failed
	Single 4 red blinks	Factory restore started
	Single 5 red blinks	COMBIVIS connect Runtime execution error, will follow a system restart
	Single 6 red blinks	USB stick data format not correct or unknown error
REMOTE CONNECTION	Steady lighted	Active when at least one Control Center client is connected to the C6 ROUTER E2, otherwise off
COM Rx COM Tx	Signal presence	These LEDs are directly connected to the serial port Rx/Tx signals and they show traffic through the lines

2.6 Front view C6 ROUTER M1

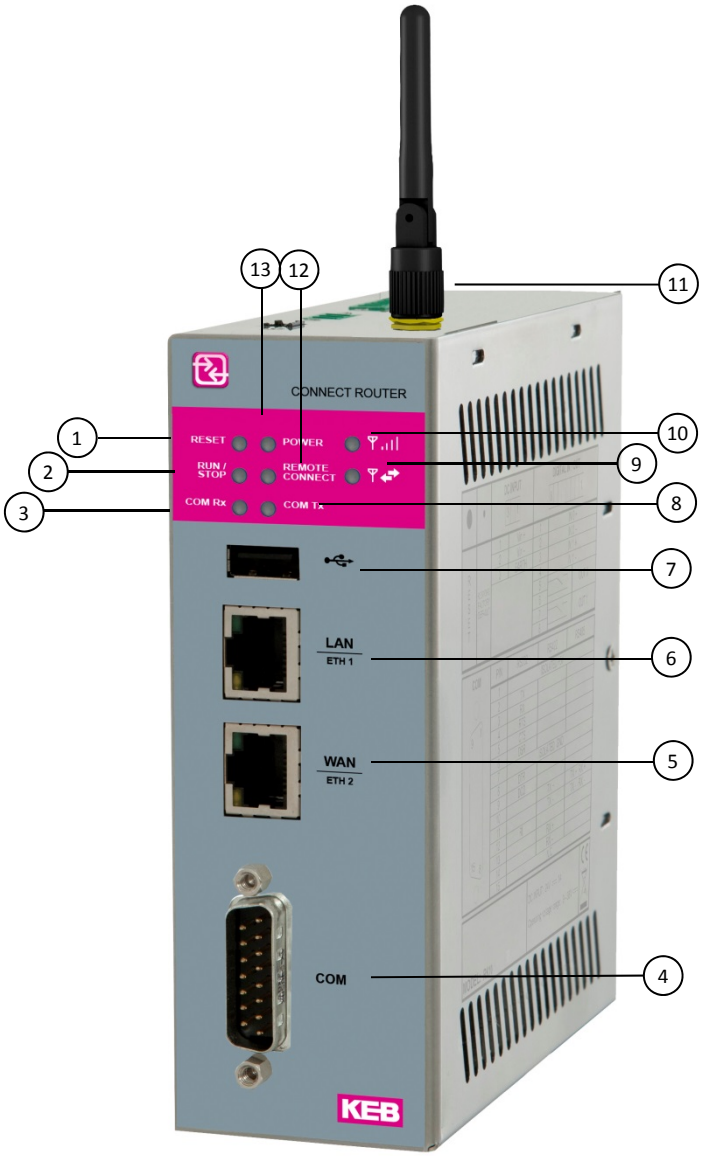


Figure 2
C6 ROUTER M1

1. Reset LED (Yellow)
2. Run /Stop LED (Green/Red)
3. COM Rx LED
4. COM
5. WAN ETH2
6. LAN ETH1
7. USB
8. COM Tx LED (Green)
9. 2G/3G/3G+ Modem Activity
10. 2G/3G/3G+ Modem Connection
11. RF antenna connector
12. Remote Connection LED (Green)
13. Power LED (Green)

The following behaviors are defined:

- **Steady lighted**
- **Blinking**
- **Continuous sequence** of a blink codes with a short pause in between to report a **status**
- **Single sequence** of a blink code to report an **event**

LED	Status	Description
RESET	Steady lighted	Active when pressing the RESET button or when in presence of a not recoverable hardware fault.
POWER	Steady lighted	Active when the COMBIVIS connect Router device is properly powered
RUN/STOP	Steady Green	COMBIVIS connect started and connected to the server
	Steady Red	COMBIVIS connect started but NOT connected to the server
	Blinking Green	COMBIVIS connect started and connecting to the server
	Blinking Red	COMBIVIS connect started but not connected to the server because not associated to any Domain
	Sequence of 2 red blinks	connection attempt to a different domain than the first of the initial registration
	Single 2 green blinks	Configuration from USB stick successfully completed
	Single 2 red blinks	User credential for Domain access not valid
	Single 3 green blinks	COMBIVIS connect Router device Update from USB stick successfully completed
	Single 3 red blinks	COMBIVIS connect Router device Updated from USB Stick failed
	Single 4 red blinks	Factory restore started
	Single 5 red blinks	COMBIVIS connect Runtime execution error, will follow a system restart
	Single 6 red blinks	USB stick data format not correct or unknown error
REMOTE CONNECTION	Steady lighted	Active when at least one Control Center client is connected to the Router, otherwise off
COM Rx COM Tx	Signal presence	These LEDs are directly connected to the serial port Rx/Tx signals and they show traffic through the lines
2G/3G/3G+ MODEM CONNECTION	Steady red	The modem has not detected network signal.
	Blinking green	The modem has detected a weak signal from the network.
	Steady green	The modem has detected a strong signal from the network.
	Blinking red	SIM error (e.g. wrong PIN).
2G/3G/3G+ MODEM ACTIVITY	Blinking green	Modem currently connected.
	Off	Modem disconnected.

2.7 Front view C6 ROUTER M2

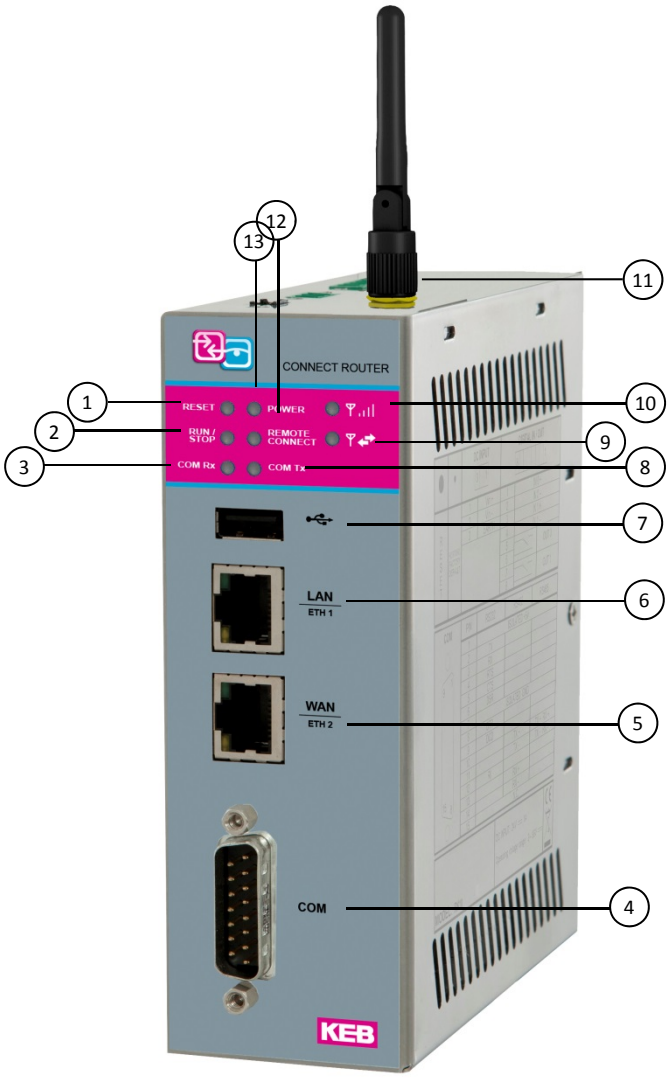


Figure 3
C6 ROUTER M2

1. Reset LED (Yellow)
2. Run /Stop LED (Green/Red)
3. COM Rx LED
4. COM
5. WAN ETH2
6. LAN ETH1
7. USB
8. COM Tx LED (Green)
9. 2G/3G/3G+ Modem Activity
10. 2G/3G/3G+ Modem Connection
11. RF antenna connector
12. Remote Connection LED (Green)
13. Power LED (Green)

The following behaviors are defined:

- **Steady lighted**
- **Blinking**
- **Continuous sequence** of a blink codes with a short pause in between to report a **status**
- **Single sequence** of a blink code to report an **event**

LED	Status	Description
RESET	Steady lighted	Active when pressing the RESET button or when in presence of a not recoverable hardware fault.
POWER	Steady lighted	Active when the COMBIVIS connect Router device is properly powered
RUN/STOP	Steady Green	COMBIVIS connect started and connected to the server
	Steady Red	COMBIVIS connect started but NOT connected to the server
	Blinking Green	COMBIVIS connect started and connecting to the server
	Blinking Red	COMBIVIS connect started but not connected to the server because not associated to any Domain
	Sequence of 2 red blinks	connection attempt to a different domain than the first of the initial registration
	Single 2 green blinks	Configuration from USB stick successfully completed
	Single 2 red blinks	User credential for Domain access not valid
	Single 3 green blinks	COMBIVIS connect Router device Update from USB stick successfully completed
	Single 3 red blinks	COMBIVIS connect Router device Updated from USB Stick failed
	Single 4 red blinks	Factory restore started
	Single 5 red blinks	COMBIVIS connect Runtime execution error, will follow a system restart
	Single 6 red blinks	USB stick data format not correct or unknown error
REMOTE CONNECTION	Steady lighted	Active when at least one Control Center client is connected to the Router, otherwise off
COM Rx COM Tx	Signal presence	These LEDs are directly connected to the serial port Rx/Tx signals and they show traffic through the lines
2G/3G/3G+ MODEM CONNECTION	Steady red	The modem has not detected network signal.
	Blinking green	The modem has detected a weak signal from the network.
	Steady green	The modem has detected a strong signal from the network.
	Blinking red	SIM error (e.g. wrong PIN).
2G/3G/3G+ MODEM ACTIVITY	Blinking green	Modem currently connected.
	Off	Modem disconnected.

2.8 UP view

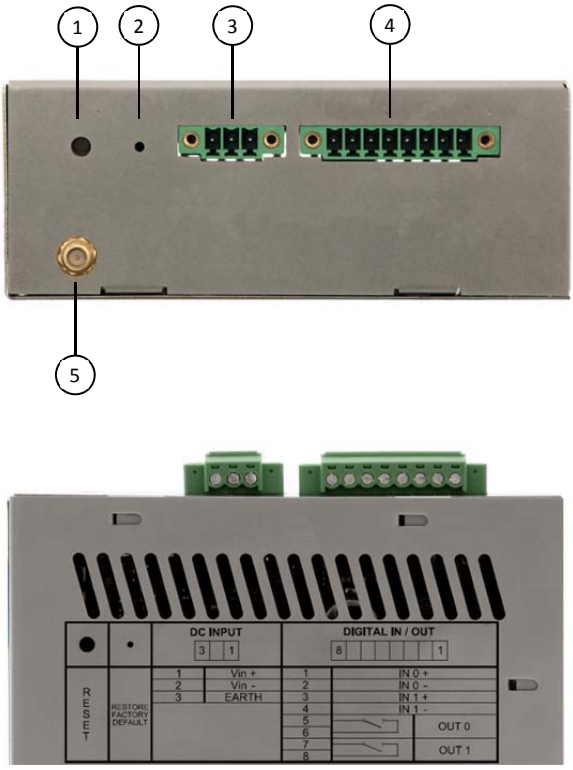


Figure 4
C6 ROUTER M1

1. Reset button
2. Restore factory defaults button
3. DC Input
4. Digital In / Out
5. Antenna connector (M1/M2 only)

RESET	Forces the device restart. The command ensures a complete initialization of all internal electronics and software. The visual feedback of the operation is returned by the RESET LED.
RESTORE FACTORY DEFAULT	Restores the COMBIVIS connect Router device to factory settings. All the settings are reset, all the system software is restored to original versions including the operating system, the firmware the COMBIVIS connect Runtime and Domain registrations (identity is removed). To execute the restore, turn off the device, press and hold down the reset button and give power. You need to hold down the button for at least 10 seconds. The starting of the restore process is indicated by the dedicated blink sequence of the LEDs. Wait for the process to be completed and system restart.

IN0	This input works as “Connection mode”, also referred as “selector key” input. By default the status of this input is ignored. When the COMBIVIS connect Router device is configured to handle the input (see “General options” in the COMBIVIS connect Router device configuration chapter) it can be used to control from outside the connection to the server. The input can be driven by a mechanical selector, by a key selector or by a PLC outputs.
IN1	This input allows controlling the device restart from outside. The operation corresponds to the RESET button. Once the command is received a proper feedback is returned by the status LED.
OUT0	The output turns active when COMBIVIS connect Router device is connected to the associated Domain. Note that the simple connection to the server does not activate the output, it is required that COMBIVIS connect is successfully authenticated to the Domain.
OUT1	The output is active when at least one Control Center client is connected to the COMBIVIS connect Router device.

2.9 Right view

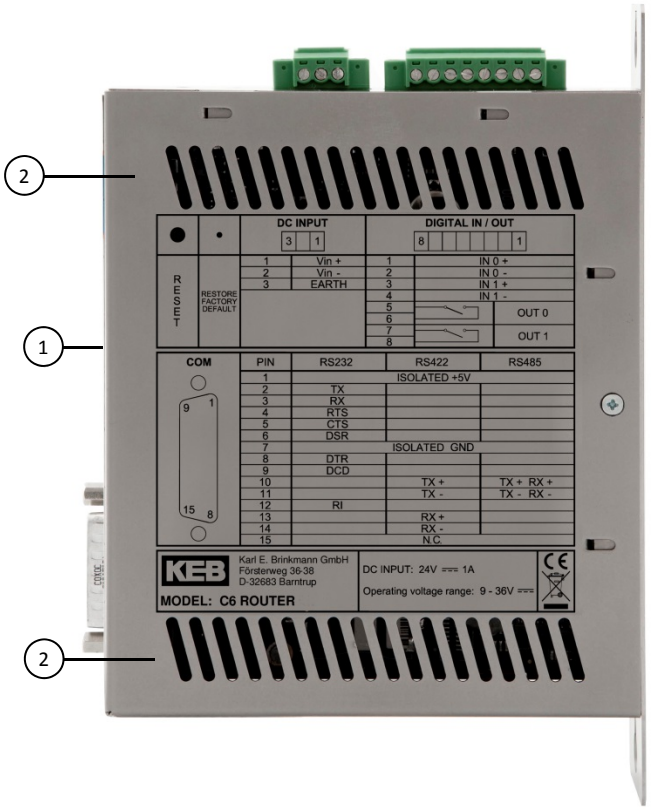


Figure 5
C6 ROUTER E1

1 Full stainless steel enclosure
2 Aeration holes

2.10 Left view

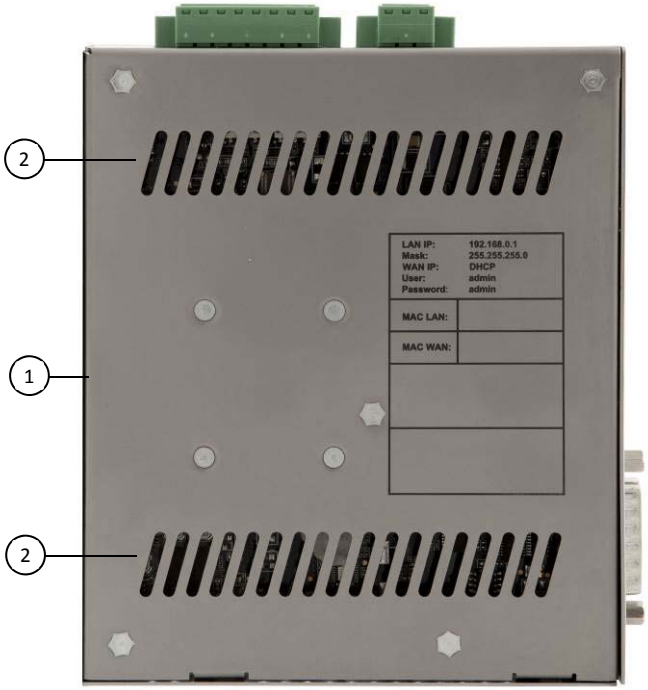


Figure 6
C6 ROUTER E1

1. Full stainless steel enclosure
2. Aeration holes

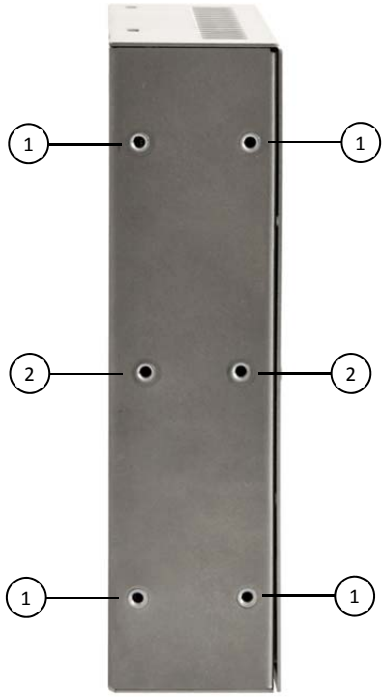
2.11 Rear view (C6 ROUTER M1/C6 ROUTER M1 ET – C6 ROUTER M2 / C6 ROUTER M2 ET)

Figure 7
C6 ROUTER M1/C6 ROUTER M2

1. Wall book mounting plate holes
2. DIN rail book mounting hook holes
3. SIM card socket

2.12 Rear view (C6 ROUTER E1/C6 ROUTER E1 ET-C6 ROUTER E2/C6 ROUTER E2 ET)

Figure 8
C6 ROUTER E1



1 Wall book mounting plate holes
2 DIN book mounting hook holes

2.12.1 Labels

On the side panels there are the following labels:

Figure 9
C6 ROUTER E1

	LAN IP	192.168.0.1
	Mask	255.255.255.0
1	WAN IP	DHCP
	User	admin
	Password	admin
2	MAC LAN code	
3	MAC WAN code	
4	Serial number	
5	Bar Code	
6	IMEI	

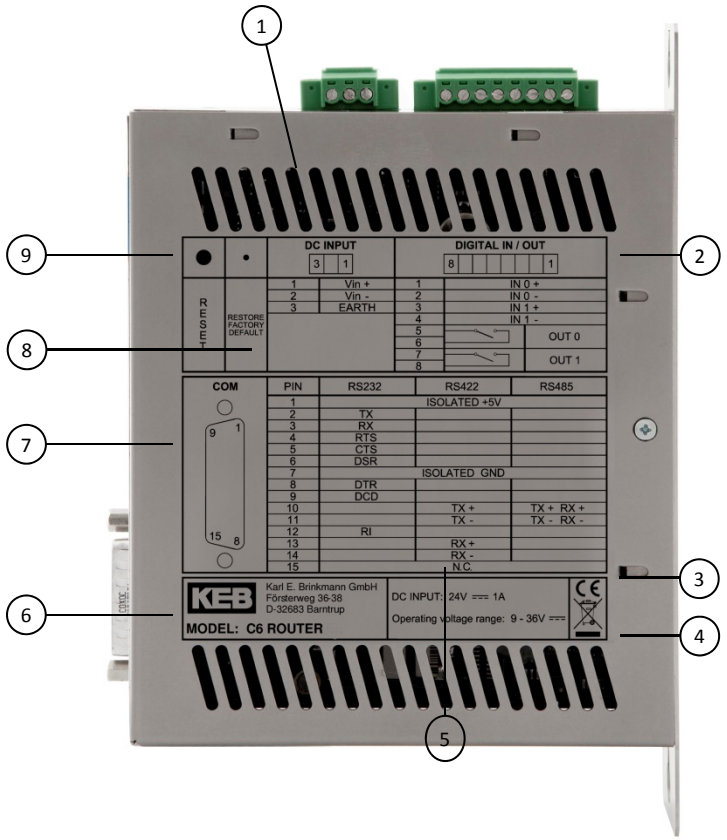


Figure 10
C6 ROUTER E1

1. DC Input pinout
2. Digital In / Out pinout
3. CE marking
4. Disposal
5. Electrical information
6. Model
7. COM pinout
8. Restore factory defaults button
9. Reset button

Figure 11
C6 ROUTER M1

1 SIM card insertion label

2.12.2 Antenna

2.12.2.1 Pentaband stilo antenna

- C6 ROUTER M1 direct mount or panel mount using extension cable
- 20W
- 0dBi
- 50 Ohms
- 48mm
- SMA-M

Figure 12
Pentaband stilo antenna

2.12.2.2 Pentaband wall-mount antenna

- 3mt cable
- wall mount with 90° bracket
- IP67
- 50W
- 2,5dBi
- 50 Ohms
- 248mm
- SMA-M

Figure 13
Pentaband wall-mount antenna

2.12.2.3 Pentaband outdor antenna

- 1mt cable
- outdoor panel mount
- IP67
- 5W
- 3,2dBi
- 50 Ohms
- 48x50mm ▪ SMA-M

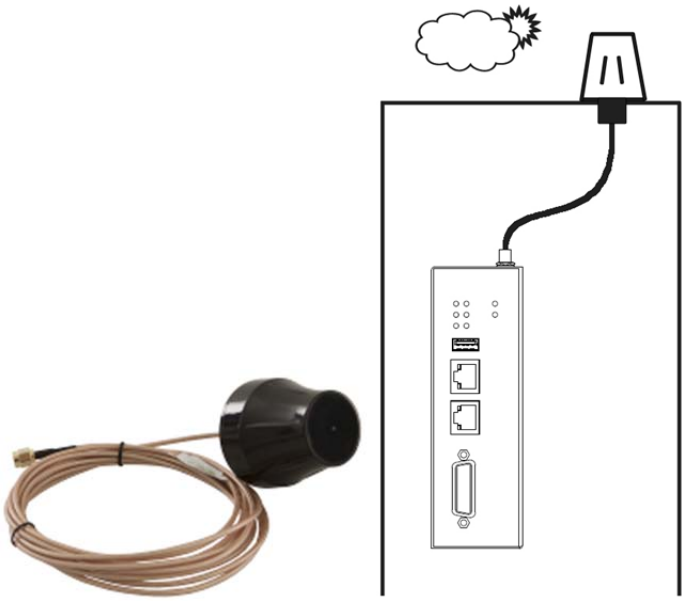


Figure 14
Pentaband outdor antenna

SECTION **3**

Installation and connection

3.1 Preparation for installation

3.1.1 Select the mounting location

Points to observe when selecting the mounting location:

a) Position COMBIVIS connect Router device such that it is ergonomically accessible for the operator.
b) Choose a suitable mounting height.
c) Ensure that the aeration holes are not covered.

3.2 Checking the package contents

- Check the package content for visible signs of transport damage and for completeness.
- In the case of damaged parts, contact your KEB representative. Do not install parts damaged during shipment.

Note:
please refer to paragraph **2.3 Package**.

3.3 Checking the operating conditions

- Read carefully the standards, approvals, EMC parameters and technical specifications for operation of the device. This information is available in the following sections:
  - Certificates and approvals (see section 8).
  - Electromagnetic compatibility (see section 8).
- Check the mechanical and climatic ambient conditions for operation of the device: Ambient conditions (see section 8).
- Follow the instructions for local use of the device: Notes about usage.
- Adhere to the permissible rated voltage and the associated tolerance range:
  - 12V and 24V
  - Range: 9÷36 V_{DC}

3.4 Mounting position

Note:
For installation in control cabinets and, in particular, in closed containers, make sure the recommended ambient temperature is maintained.
For further details please refer to section 8.1 Technical specifications.

The COMBIVIS connect Router device is suitable for installation in:

- Mounting cabinets
- Control cabinets
- Switchboards

3.4.1 Damage due to overheating

- The operative temperature must range between 0° and 50°C for E1,E2, M1, M2 devices.
- The operative temperature must range between -20° and +70°C for E1-ET, E2-ET.
- The operative temperature must range between -20° and +60°C for M1-ET, M2-ET devices.
- COMBIVIS connect Router device system is designed for book mounting position (both wall book mount and DIN book mount).
- An inclined installation reduces the thermal convection of the device and the maximum permissible ambient temperature for operation. Please contact KEB for details.
- The device may otherwise be damaged and its certifications and warranty will be void.

3.5 Preparing the mounting

In order to ensure a proper mounting of the system, the material of the mounting frame must be sufficiently stable.

3.6 Mounting the device

3.6.1 Installation procedure wall mounting

The system can be installed on a panel as follows:

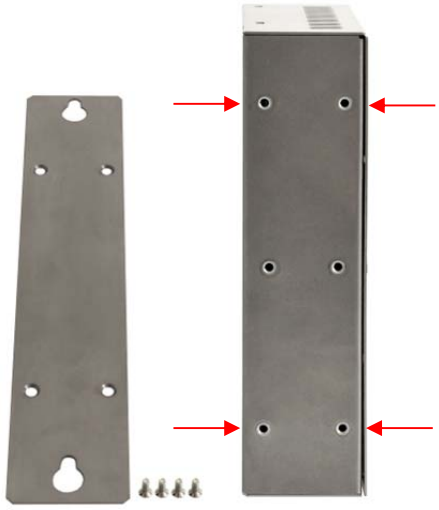


Figure 15
Installation procedure wall mounting

- Install the hook as illustrated in the picture.

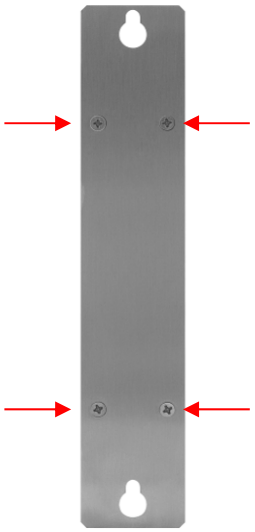


Figure 16
Installation procedure wall mounting

- Drill the required holes on the housing panel according to the instructions detailed in the figure.
- There are 2 fastening points. Fastening can be made using stainless steel screws M4x20.

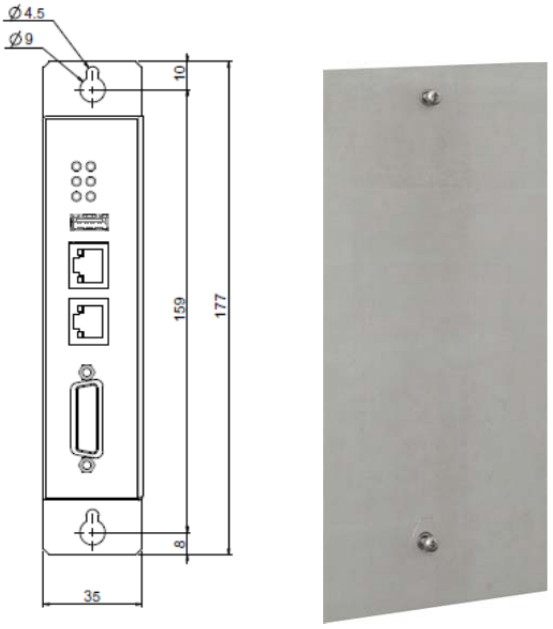


Figure 17
Installation procedure wall mounting

- Hang the system as shown in the figure.

Figure 18
Installation procedure wall mounting

Step 1:
first lift and insert the top.

Figure 19
Installation procedure wall mounting

Step 2:
align the bottom

Figure 20
Installation procedure wall mounting

Step 3:
Release the top to match the slots with the screws.

Figure 21
Installation procedure wall mounting

Step 4:
Tighten
two screws.

3.6.2 Installation procedure DIN guide mounting

The system can be installed on a DIN guide as follows:

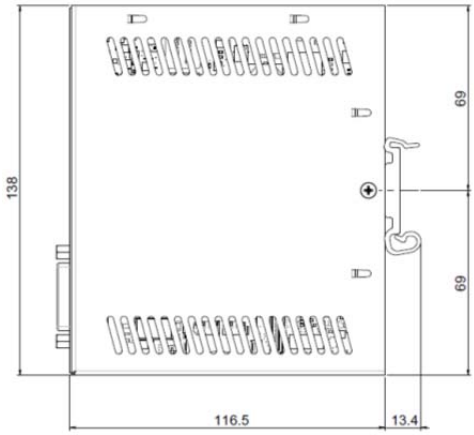


Figure 22
Installation procedure wall mounting

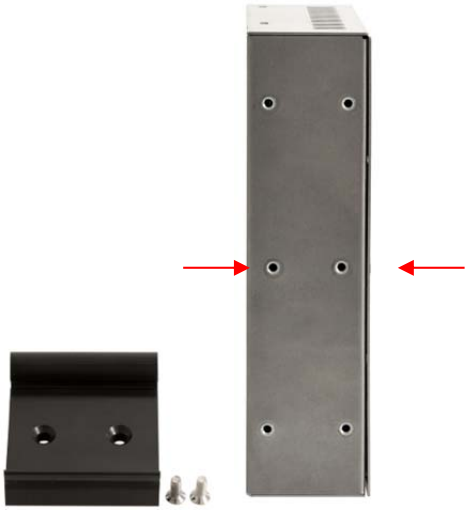


Figure 23
Installation procedure wall mounting

- Install the DIN hook as illustrated in the picture.

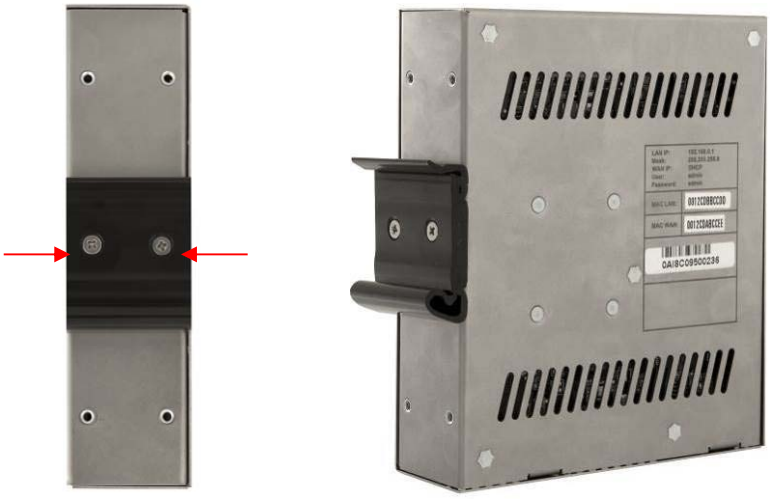


Figure 24
Installation procedure wall mounting

- Hang the system to the DIN guide.

Figure 25
Installation procedure wall mounting

- Example of correct installation.

Figure 26
Installation procedure wall mounting

To remove the system from the DIN guide:

- Lift the system up and release it from the DIN guide

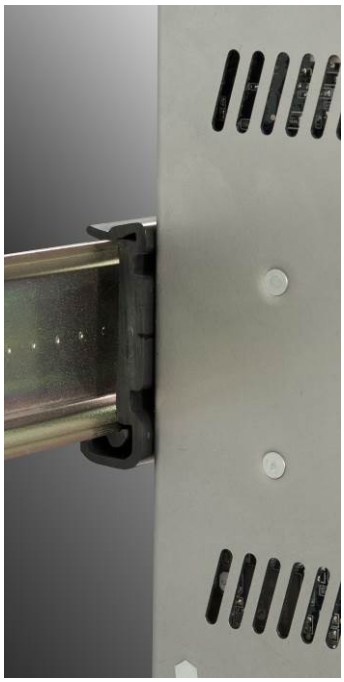


Figure 27
Installation procedure wall mounting

3.7 SIM installation

The SIM card is not provided with the product.
The SIM card must be associated with a data traffic plan. The traffic plan must be properly chosen depending on foreseen traffic generated by the remote assistance sessions and SMS notification usage (for E2/M2 models).
The SIM card must be of ID-000 (ISO/IEC 7810) standard format (25 mm × 15 mm).

Figure 28
SIM card installation

- Insert correctly the SIM card as shown in the picture

Figure 29
SIM card insertion

- Pull the SIM card in the hole till you listen a “clic”

Figure 30
SIM card insertion

Figure 31
SIM card inserted (datail)

3.7.1 Antenna Installation

3.7.1.1 Pentaband stilo antenna

For dimension installation please refer to pararagraph 6.4

Figure 32
Pentaband stilo antenna installation

- Drill a 6.5mm hole on the metal.

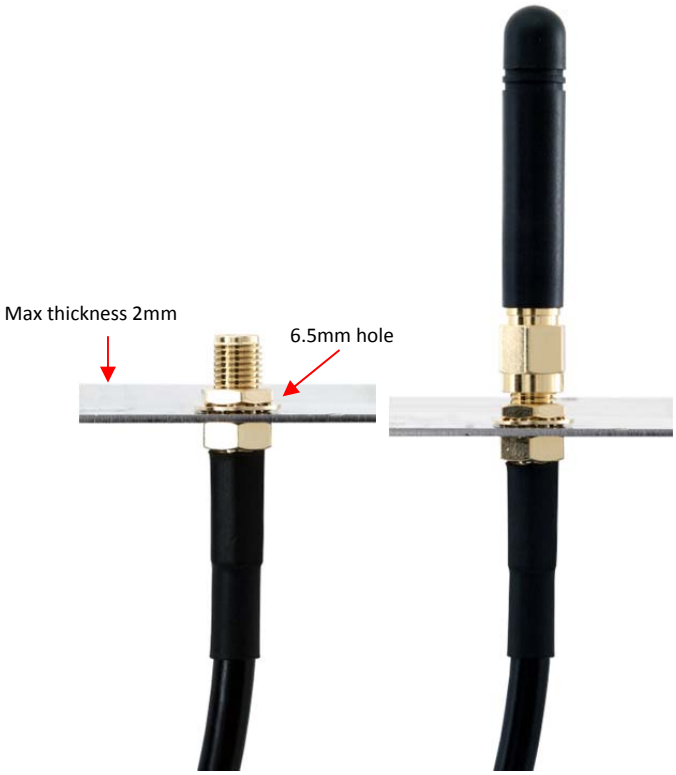


Figure 33
Pentaband stilo antenna installation

Recommended torque for mounting is 0.9 Nm.

3.7.1.2 Pentaband wall mount antenna

For dimension installation please refer to pararagraph 6.4

Figure 34
Pentaband wall-mount antenna installation

For dimension installation please refer to pararagraph 6.5

3.7.1.3 Pentaband outdor antenna

For dimension installation please refer to pararagraph 6.6

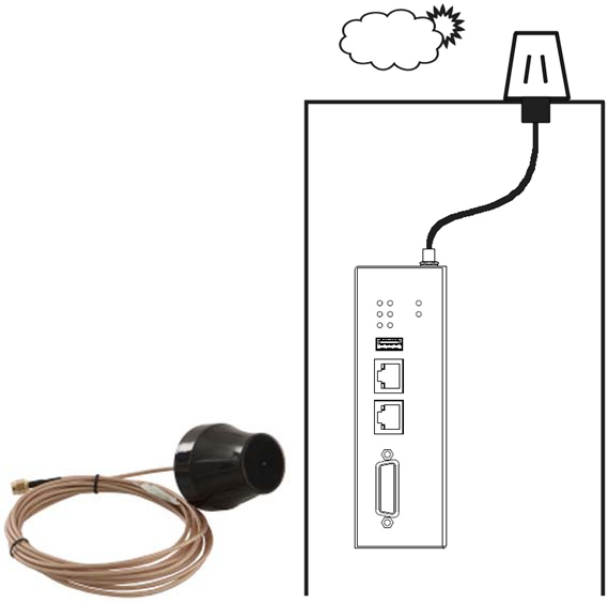


Figure 35
Pentaband outdor antenna installation

- Drill a 13mm hole on the Metal.

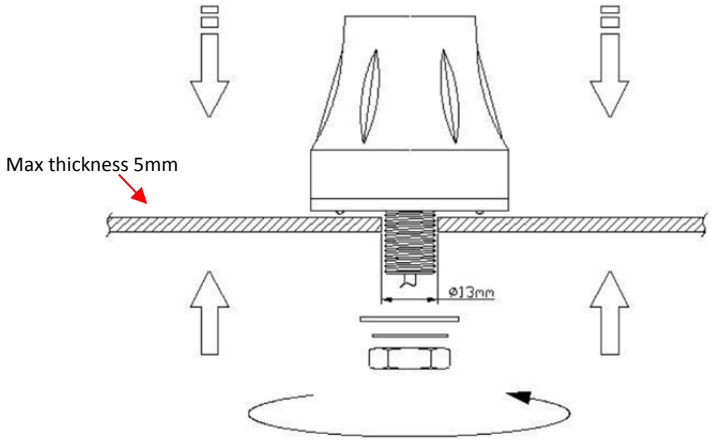


Figure 36
Pentaband outdor antenna installation

- Recommended torque for mounting is 2.94 Nm.
- Maximum torque for mounting is 3.92 Nm.

3.8 Connecting the device

3.8.1 Notes on connection

- COMBIVIS connect Router device must be installed in accordance with the indications contained in this operating instructions.
- These devices are intended to be connected to a “Secondary Circuit Over-voltage Category II”

3.8.2 Grounding and bonding

Attention: the system must be powered with a voltage of 12V or 24V (9V÷36V) DC.

- Whenever two pieces of equipment connected to each other are far apart, it is possible that their ground connections could be at a different potential level. The data cable screens connecting the equipment’s chassis on one end and the COMBIVIS connect Router device’s chassis on the other end can therefore be subject to a high current circulation capable of destroying the interface. To overcome this hazard such current must be steered away from the interface. To achieve this goal the following methods can be used:

1. Use an equipotential bonding cable (16mm^2, suitable at least 75C°) to connect the equipment’s’ ground to the COMBIVIS connect Router device’s ground.
2. Connect the data cable screens to the equipotential bonding rail on both sides before connecting the cable to the interfaces.

3.8.3 Power supply connection

The device may only be connected to a 12V or 24V ⎓ (maximum permissible operating voltage range 9V to 36V) power supply which satisfies the requirements of safe extra low voltage (SELV) in accordance with IEC/EN/DIN EN/UL60950-1.

The power supply has to fulfill the requirements NEC Class2 or LPS in accordance with IEC/EN/DIN EN/UL60950-1

Connect the device with a cable cross-section of 0.75 – 1.5 mm^2 (AWG18 to AWG16 suitable at least 75C°).

- Remove the three poles connector from the system.
- Connect the positive pole, the negative and the ground one (also refer to the label on the back of the system) to the related terminals of the three pole connector.

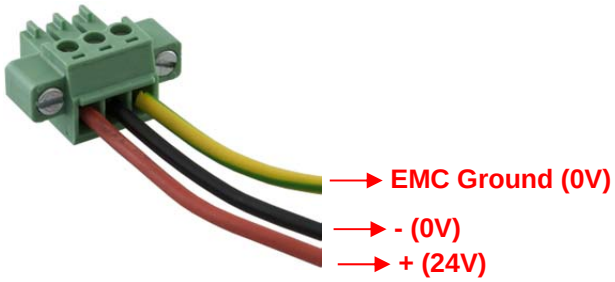


Figure 37
Power supply connection detail

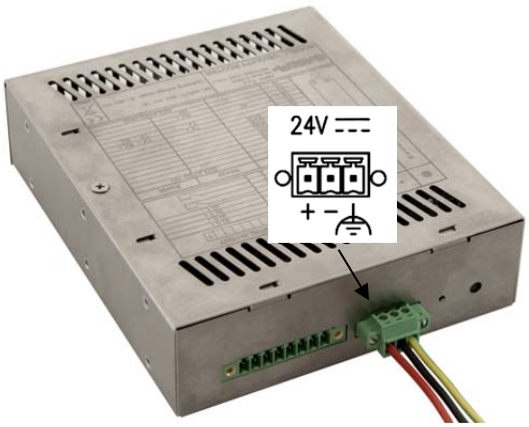


Figure 38
Power supply connection detail

3.8.4 Connecting the Ethernet ports

The Routers have always two Ethernet ports, one referred as WAN, the other one referred as LAN.

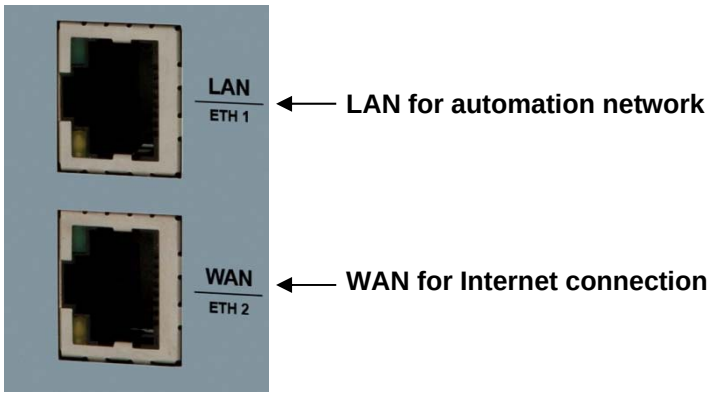


Figure 39
Ethernet connection detail

When using the cable connection for Internet, it must be connected to the WAN port.
The LAN port shall be connected to the automation sub-network.

3.8.5 Switching on and testing the COMBIVIS connect Router device Device

Connect the power supply cable to COMBIVIS connect Router device. Switch the power supply on. The green POWER LED will light on.

Figure 40
Power supply connection detail

Please refer to the COMBIVIS connect Control Center online help for all the details about how to configure and use COMBIVIS connect Router device.

3.9 Connecting the serial port

A unique DB15 male connector hosts all serial protocols (please check par. 6.4.1 for pin-out details) so it is necessary to adapt this connection to plant needs; KEB can supply connector adapters as optional parts but user can adapt DB15 connector by himself.
For further details please contact KEB.

3.9.1 Connecting to MPI or PPI networks

The electrical specification of the MPI networks are often referring to the use of DB9 connectors like the one shown in the figure below.

Figure 41
DB9 connector detail

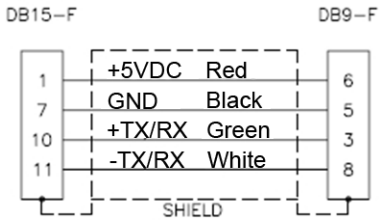
The connector provides also the pass-through DB9 female connector for the MPI cable of the programming device.

In order to support the use of the standard Profibus / MPI connectors available on the market, we suggest to use the cable converter (available as accessory) to transform the DB15-M connector of the panel COM port into the standard DB9-F required by the connectors.

The adapter is shown in the following figure.

Figure 42
Adapters detail

The internal connection are made according to the following table.



The line termination and polarization is normally realized by using resistors mounted internally to the standard Profibus / MPI connectors.

The cable adapter provided by KEB provides on the DB9-F connector side all the signals required by the MPI communication and line termination.

The KEB cable converter does NOT contain resistors for line termination.

Present notes do not replace the official documentation about Profibus and MPI network wiring. Please refer to official specification for any additional detail.

For further details, please contact KEB.

3.10 Connecting digital I/O

In this section will be shown some example on how to connect the digital I/O to key, button and lamps.

3.10.1 IN0 - WAN connection enabling security key

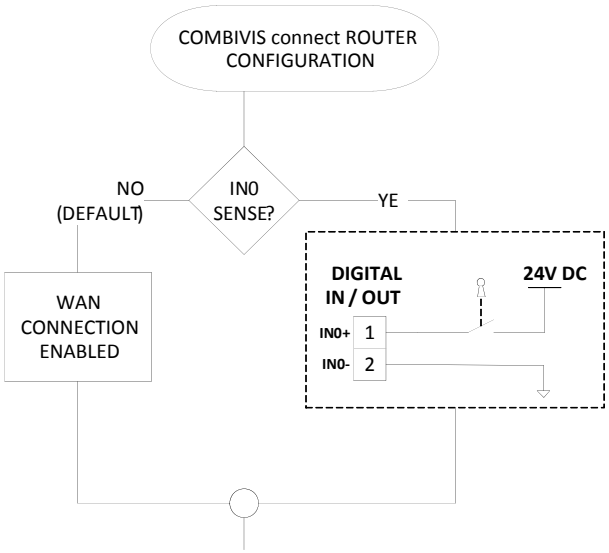


Figure 43
IN0 – WAN connection enabling security key example

3.10.2 IN1 – Reset input

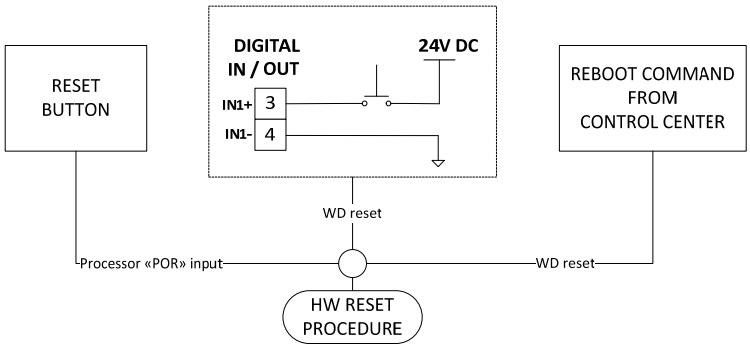


Figure 44
IN1 – Reset input

3.10.3 OUT0 - WAN connection enabled signalling

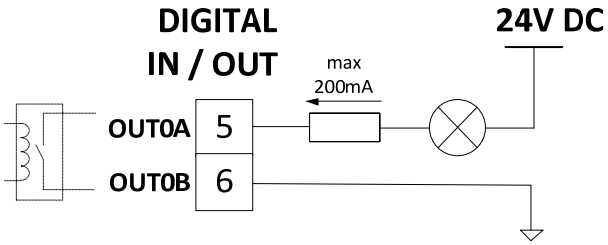


Figure 45
OUT0 – WAN connection enabling signalling example

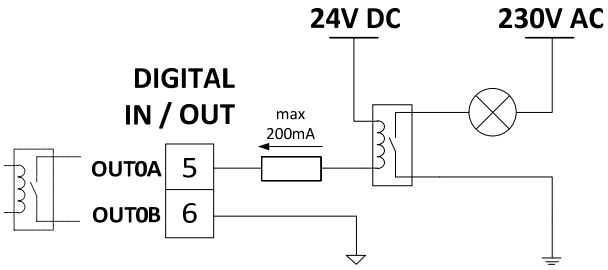


Figure 46
OUT0 – WAN connection enabling signalling example

3.10.4 OUT0 – Remote assistance service running

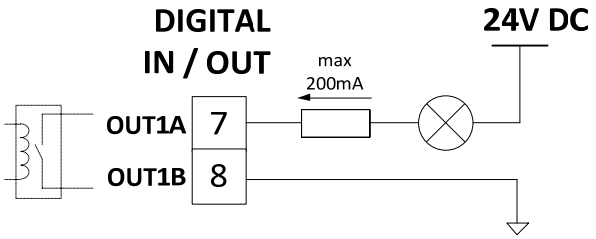


Figure 47
OUT0 – Remote assistance service running example

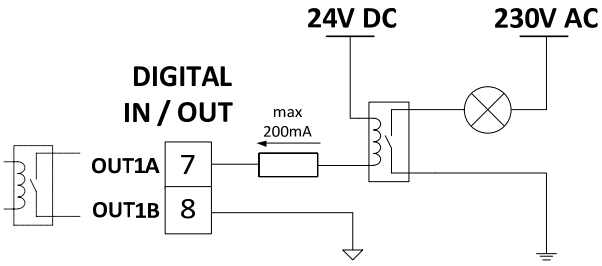


Figure 48
OUT0 – Remote assistance service running example

SECTION **4**

Commissioning

4.1 Configuring

COMBIVIS connect Router system software is designed to reduce as much as possible the user intervention and simplify the few mandatory settings.
No settings is required for VPN and for the bridging of the Ethernet interfaces.
All basic settings are made at factory level. No changes are requested to the user.

The COMBIVIS connect Router device configuration is limited to the network interfaces IP addresses, to the serial port configuration, to the connection mode and Domain registration.

COMBIVIS connect Router device can be configured in two ways:
- Using a network connection
- Using a USB stick on which the configuration file was copied

In both cases the configuration is done using COMBIVIS connect Control Center.

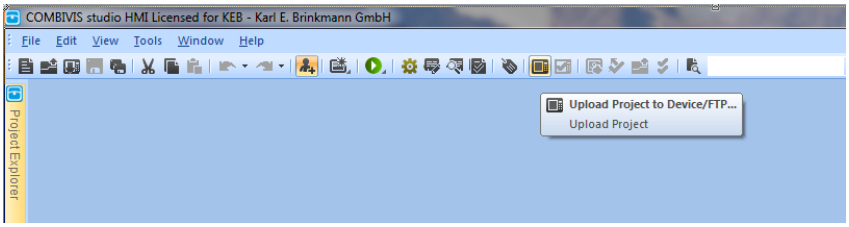
Please refer to the COMBIVIS connect Control Center online help for all the instructions about how to configure and make the COMBIVIS connect Router device commissioning.
COMBIVIS connect Router device requires for the configuration COMBIVIS connect Control Center version 2 or above. Control Center is available for download in the dedicated product section of the www.keb.de website.

4.1.1 COMBIVIS connect Router E2/M2 models

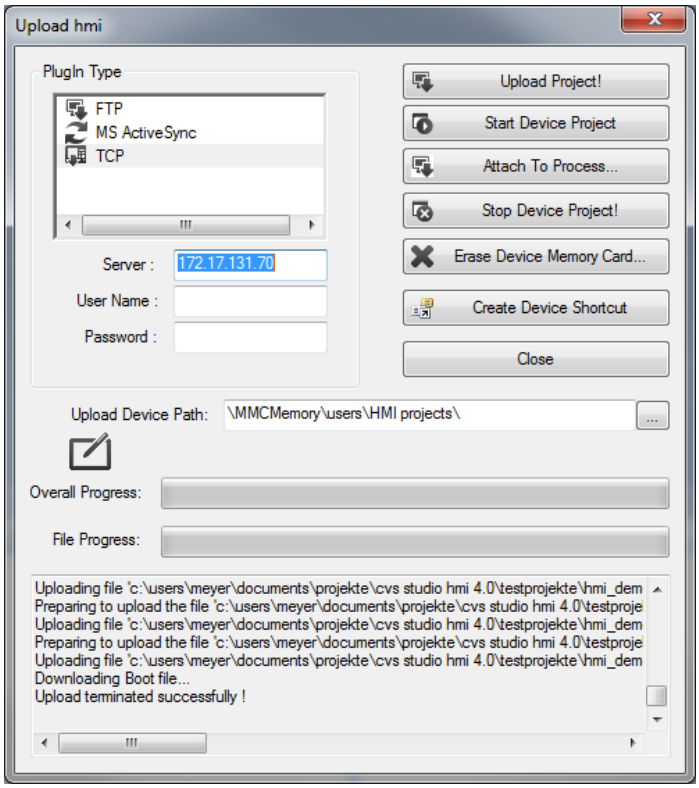
COMBIVIS connect Router devices with data monitoring functionality (E2/M2 models) can be additionally configured to run a COMBIVIS HMI project for data collection, alarm notification and web visualization.
Those models come out from production already configured with all the required application software and they are ready to be programmed by means of a standard COMBIVIS studio HMI.

Note: The E2/M2 systems are featuring COMBIVIS HMI Runtime Advanced for WinCE and they must be programmed using COMBIVIS studio HMI version 4 or above.

To transfer a COMBIVIS HMI project to a COMBIVIS connect Router E2/M2 device, you just need to specify in the COMBIVIS HMI transfer dialog the IP address of the router and provide the path for file storage in the router internal memory.
Start COMBIVIS HMI Developing tool.
Load the project to transfer.
Click on the transfer icon (see picture below).



The following window will appear:



Select TCP in the upper left list.
Write the IP address of the Router (WAN or LAN port IP)
Choose where to download the project into the Router specifying the “Upload Device Path”.

Note: the project must be transferred to the “MMCMemory” data storage device.

To transfer the project click on the button “Upload Project!”.
Once the transfer is completed, click “Start Device Project” to run the application.

Note: the name of the memory are according to the following table:

Memory	Name used by operating system	Note
NAND	NANDFlash	Internal memory used to store the operating system. It is a read only memory.
MMC	MMCMemory	Memory to store data and executables. Read and Write memory.

Please refer to “COMBIVIS connect software user guide” for additional information about how retrieving data loggers from the E2/M2 router systems.

Note: COMBIVIS connect E2/M2 models with integrated 2G/3G/3G+ modem support the SMS alarm notification; the COMBIVIS HMI Alarm Dispatcher software is already configured to use the internal modem, you just need to configure the alarm thresholds according to the application requirements.
Please see the COMBIVIS studio HMI online help for further information about how to setup alarm notification via SMS

Note: COMBIVIS connect E2 models without integrated modem, DO NOT support alarm notification via SMS. Only notification via email is supported.

SECTION **5**

Maintenance and care

5.1 Maintaining & cleaning

COMBIVIS connect Router device is designed for maintenance-free operation except for the replacing of the battery backup when necessary.

Attention: Do not use detergents, solvents, cleaners or objects that could scratch the surface.

Attention: switch off the power before any cleaning operation.

5.1.1 Backup battery replacement (CR1220 3V)

- Remove the two columns as indicated in figure.

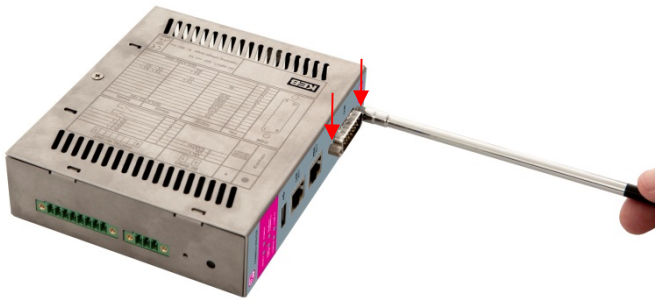


Figure 49
Backup battery replacement

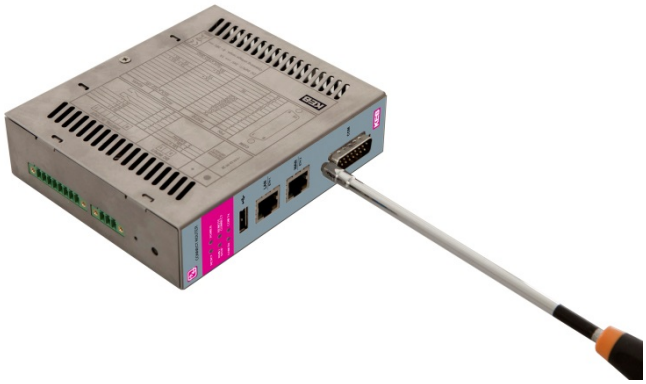


Figure 50
Backup battery replacement

- Remove the screw as indicated in figure.

Figure 51
Backup battery replacement

- Locate the battery position.

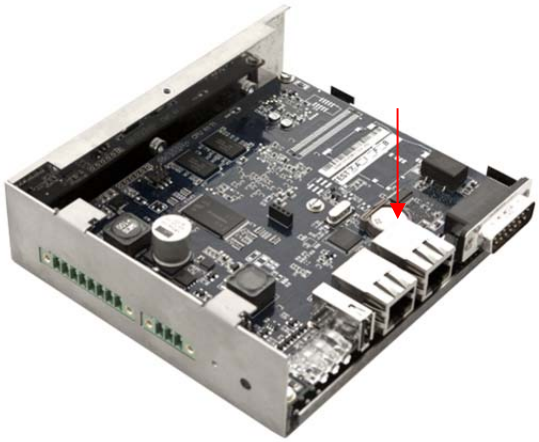


Figure 52
Backup battery replacement

Remove the battery.

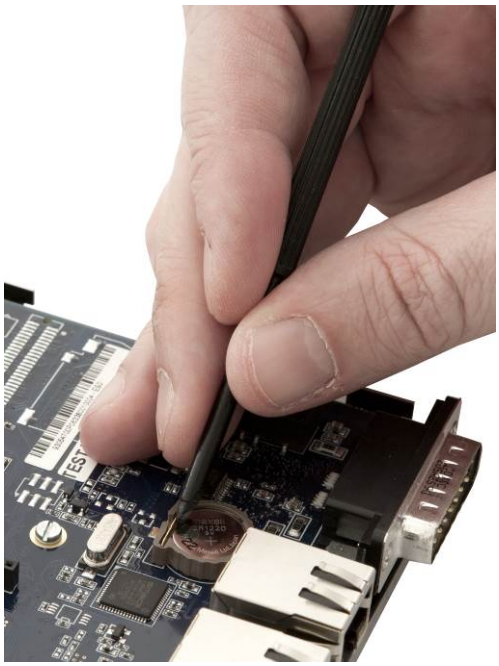


Figure 53
Backup battery replacement

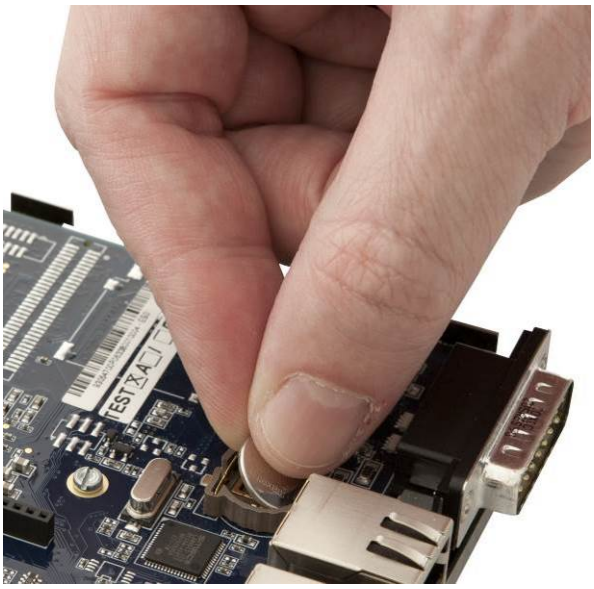


Figure 54
Backup battery replacement

- Replace it with one of the same model (CR2032 3V).

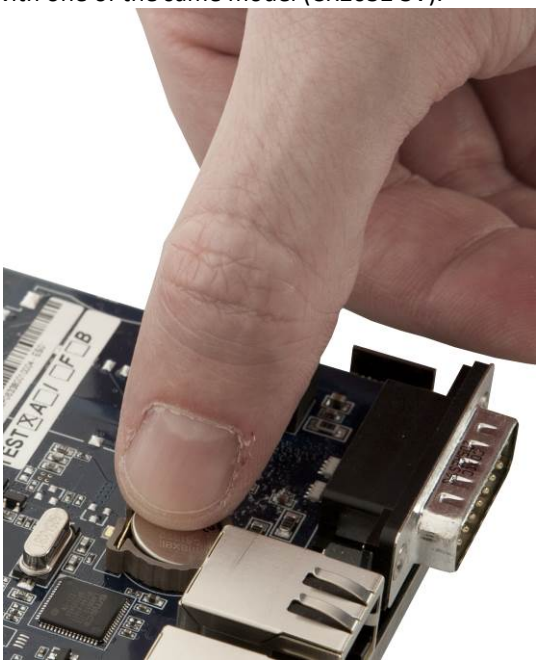


Figure 55
Backup battery detail

5.2 Backup and restore

COMBIVIS connect Router device supplies tools to backup and restore the contents of its internal memory in order to manage the configuration and the operating system of COMBIVIS connect Router device. For more information please see the COMBIVIS connect Control Center online manual or contact the KEB support center.

5.3 Updating the system

COMBIVIS connect Router device is a hardware device that works thanks to a set of software components; they can be divided in:

- Firmware
- COMBIVIS connect Runtime
- COMBIVIS HMI Runtime (for E2/M2 models only)

All the COMBIVIS connect Router device software components can be changed using a very simple procedure, fully automatic, safe and fast.

Figure 56
SIM card socket

The software components upgrades are distributed in the format of a single file that works as “container” for the components to be replaced.
To execute an update copy the “.asr” file on the root folder of an USB Stick. Plug the USB Stick into the COMBIVIS connect Router device USB port and cycle the power.
During the power up phase, the COMBIVIS connect Router device recognizes the presence of the USB Stick with the update and it will immediately start the system software update procedure.
A proper visual feedback will inform about the status of the operation.
No action is requested by the user.
The update is completed after the COMBIVIS connect Router device is automatically restarted.
Please contact the technical support for further information.

5.4 Technical support & repairs

KEB offers wide-ranging, complete after-sales technical support. The staff who deal with this handle questions on the entire range of products skillfully, quickly, and efficiently.
You can phone our staff in the service department, and they will give you complete, prompt advice on how to resolve your problems.

telephone: +49 (0) 5263 401-0
fax: +49 (0) 5263 401-116
e-mail: combicontrol@keb.de

5.5 Recycling and disposal

COMBIVIS connect Router device can be recycled due to the use of materials with low environmental impact. Contact a certified disposal service company for environmentally sound recycling and disposal of your old devices.

SECTION **6**

Technical specifications

6.1 Technical specifications

Table 2
System software characteristics

System software characteristics		
Integrated system software	Operating System	Microsoft Windows Embedded Compact 7 (C7P)
	Other software	KEB COMBIVIS connect runtime firmware

Table 3
System hardware characteristics

System hardware characteristics		
Motherboard	Model	All-in-one, KEB R171
	RTC	Hardware with battery backup
CPU C6 ROUTER E1	Processor	ARM Cortex A8 - Freescale i.MX535 - 1 GHz
	Memory bus	400MHz
CPU C6 ROUTER E1ET	Processor	ARM Cortex A8 - Freescale i.MX537 - 800 MHz
	Memory bus	400MHz
System memory	Type / Size / Socket	512 MB, / DDR3-800 / Soldered
Serial interfaces	Type	1 x RS232/422/485 (DB15M) software selectable
	Optoisolation	Yes
Ethernet interfaces	Type	1 x 10/100Mbps WAN (RJ45) with Link/Activity leds 1 x 100Mbps LAN (RJ45) with Link/Activity leds
2G/3G/3G+ modem (only for C6 ROUTER M1/M2)	Type	provides data service under global GSM/GPRS/EDGE/WCDMA networks (14.4Mbps downlink data rate)
USB interfaces	Type	1 x USB 2.0 (TYPE-A, host port, software switch off)
Mass storage	Internal / not removable	**NAND-FLASH**: 256 MB (Read Only) for Operative System and other system software. **eMMC**: 2/4 GB - 8 bit v. 4.4 compatible (application software and COMBIVIS connect Runtime)
Battery	Type	Coin (CR1220 3V) removable non rechargeable
	Lifetime	3 years
Buttons, LEDs and keys	Reset Button Factory Recovery Button	System User
	LEDs	Reset Power Run / Stop Remote Connection COM Rx COM Tx 2G/3G/3G+ Modem. activity Modem connection

Table 4
Electrical characteristics

Electrical characteristics		
Power supply	Type	Integrated on board, auto ranging
	Input voltage	9÷36 VDC with 3 poles connector
	Protections	Anti-inversion polarity, over-voltage, fuse soldered on the board

These devices are intended to be connected to a "Secondary Circuit Overvoltage Category II"

Table 5
Mechanical characteristics

Mechanical characteristics		
Case	Type	Book mount
	Material	Steel, white zinc galvanizing

Table 6
Environmental characteristics

Environmental characteristics		
Temp. C6 ROUTER E1, C6 ROUTER E2, C6 ROUTER M1, C6 ROUTER M2	Operation	-0° ÷ +50°C
	Storage	-20° ÷ +60°C
Temp. C6 ROUTER E1ET, C6 ROUTER E2ET	Operation	-20° ÷ +70°C
	Storage	-30° ÷ +80°C
Temp. C6 ROUTER M1ET, C6 ROUTER M2ET	Operation	-20° ÷ +60°C
	Storage	-30° ÷ +80°C
Humidity	Operation/Storage	80% (non-condensing)

Table 7
Panel antenna characteristics

Panel antenna characteristics

Electrical	
Frequency range	800MHz to 2200MHz
Bands	GSM-DCS-PCS-UMTS-CDMA-GPRS-EDGE-HSPA
VSWR	≤ 2.3
Polarization	Linear
Power handling	20 W
Impedance	50 Ohms
Connector	Straight SMA(M)
Environmental & Mechanical	
Temperature	-40° to +85°C
Radome color	Black
Radome material	Pu
Weight	6 g

Wall mount Panel antenna characteristics

Table 8
Wall mount Panel antenna characteristics

Cellular					
Frequency (MHz)	824 ~ 896	880 ~ 960	1710 ~ 1880	1850 ~ 1990	1710 ~ 2170
Peak Gain (dBi)					
Free Space	-0.7	-0.9	1.7	2.5	2.2
L - Bracket	4.0	3.6	2.8	3.8	3.3
Average Gain (dBi)					
Free Space	-5.7	-5.3	-2.2	-2.1	-2.3
L - Bracket	-1.7	-1.8	-2.2	-1.7	-1.9
Efficiency					
Free Space	27%	30%	61%	62%	60%
L - Bracket	69%	66%	59%	68%	65%
Impedance	50Ω				
Polarization	Linear				
Radiation Pattern	Omni				
Input Power	50 W				
Mechanical					
Dimensions	Height 248 ± 5 mm				
Base Diameter	17.08 ± 0.2 mm				
Whip Diameter	4 ± 0.2 mm				
Casing	ABS				
Connector	SMA Male				
Environmental & Mechanical					
Temperature range	-40° to +85°C				
Humidity	Non condensing 65°C 95% RH				

Table 9
Outdor Panel antenna characteristics

Outdoor Panel antenna characteristics

Electrical			
Antenna	G30		
Standard	2G/3G/4G		
Operation Frequency (MHz)	698~960 MHz	1710~2170 MHz	2500~2800MHz
Peak Gain	1.2 dBi	3.2dBi	2.5dBi
Average Gain	-4.5 dB	-2.5dB	-4.5dB
Efficiency	40%	55%	40%
VSWR	<3.0:1		
Impedance	50Ω		
Polarization	Linear		
Radiation Properties	Omni-directional		
Max Input Power	5 W		
Mechanical			
Dimensions (mm)	Height=48mm and Diameter=50mm		
Cable	Length=1m RG316*		
Casing	UV Resistant ABS		
Base and Thread	Nickel plated Copper		
Connector	SMA(M) Fully Customizable		
Nut	Nut M12		
Sealant	Rubber Stopper		

6.2 Certificates and approvals

- KEB products are compliant with European Directive 2004/108/CE concerning electromagnetic compatibility and Directive 2006/95/CE concerning the safety of electrical products, and subsequent variations.
- RoHs 2011/65/UE.

CE

Note:
For further details please contact KEB

Emission

- Conforms to EN 55022 Information technology equipment – Radio disturbance characteristics.
- Conforms to EN 61000-3-2 Harmonic current emissions.
- Conforms to EN 61000-3-3 Voltage fluctuations ad flicker.
- Additional Regulatory for C6 ROUTER M1 / M2

Immunity

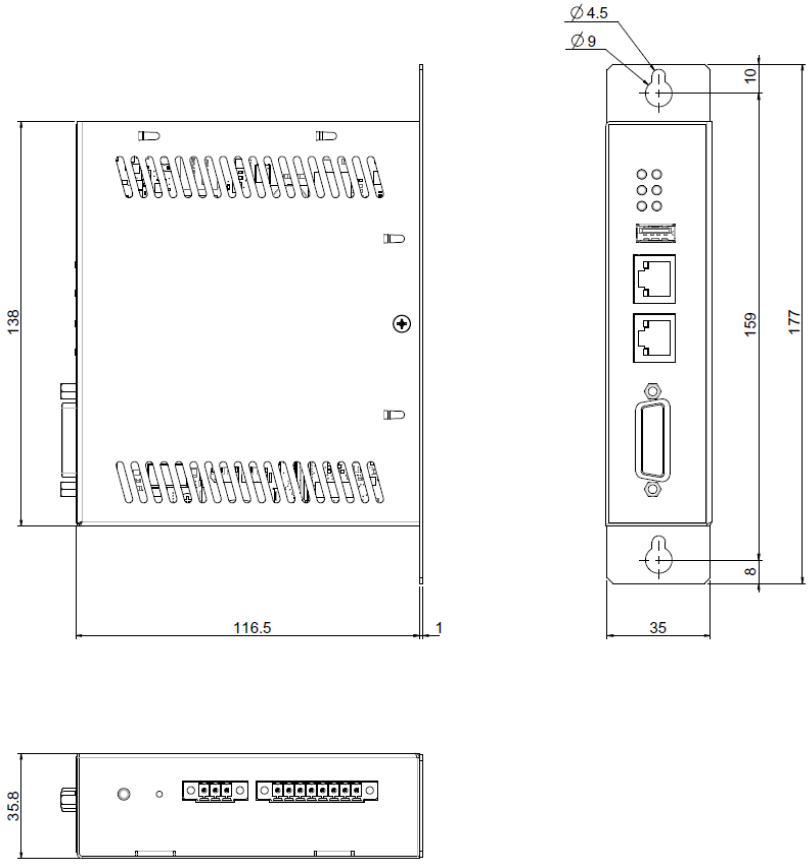
- Conforms to EN 55024 Information technology equipment – Immunity characteristics.
- Conforms to EN 61000-6-2 Generic standard immunity for industrial environments.
- Conforms to EN 61000-4-2 Electrostatic Discharge – ESD.
- Conforms to EN 61000-4-3 Radio-Frequency Electromagnetic Field Susceptibility Test – RS.
- Conforms to EN 61000-4-4 Electrical Fast Transient/Burst – EFT.
- Conforms to EN 61000-4-5 Surge Immunity Test.
- Conforms to EN 61000-4-6 Conducted Radio Frequency Disturbances.
- Conforms to EN 61000-4-8 Magnetic field immunity.
- Conforms to EN 61000-4-11 Electromagnetic compatibility-Voltage dips, short interruptions and voltage variations immunity test.
- Additional Regulatory for C6 ROUTER M1 / M2

Safety

- Conforms to EN 60950-1 – Information technology equipment – Safety

6.3 Dimension drawings

Figure 57
Dimensions



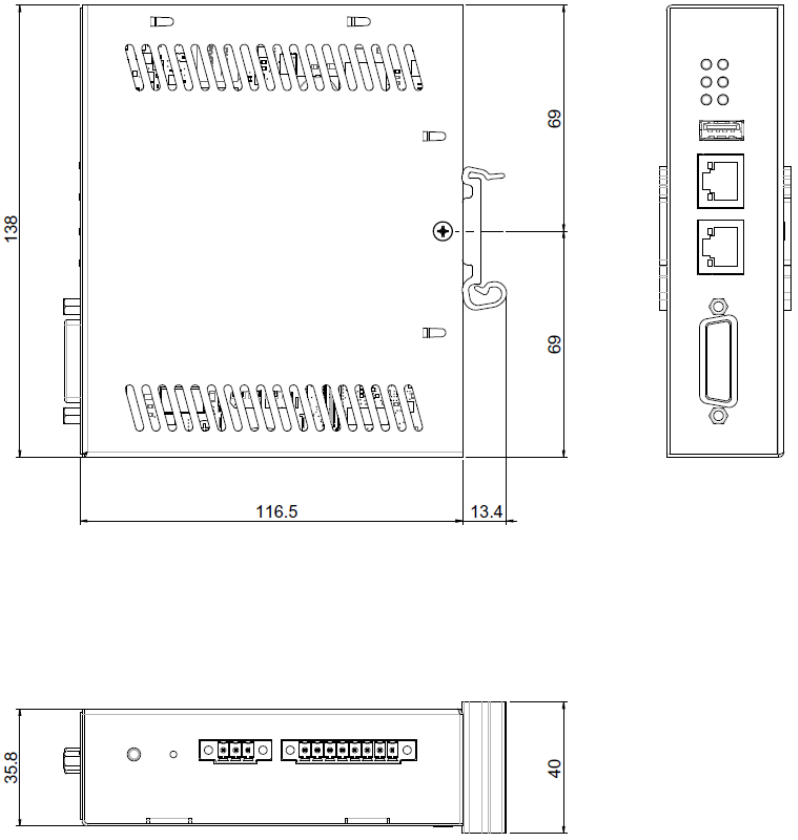


Figure 58
Dimensions

6.4 Panel antenna drawing dimensions

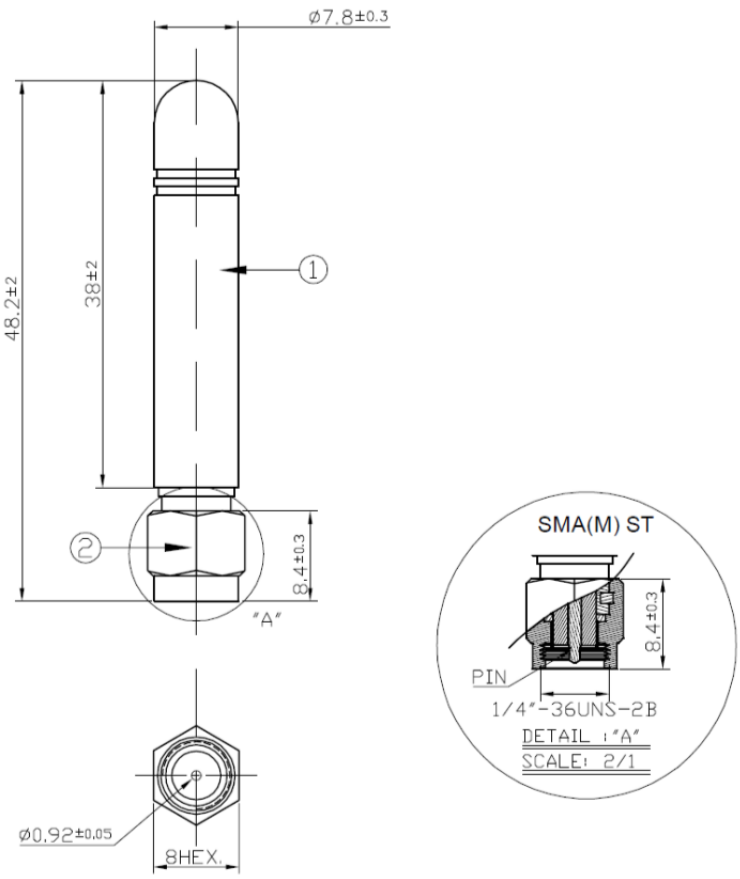


Figure 59
Panel antenna drawing dimensions

6.5 Wall mount antenna drawing dimensions

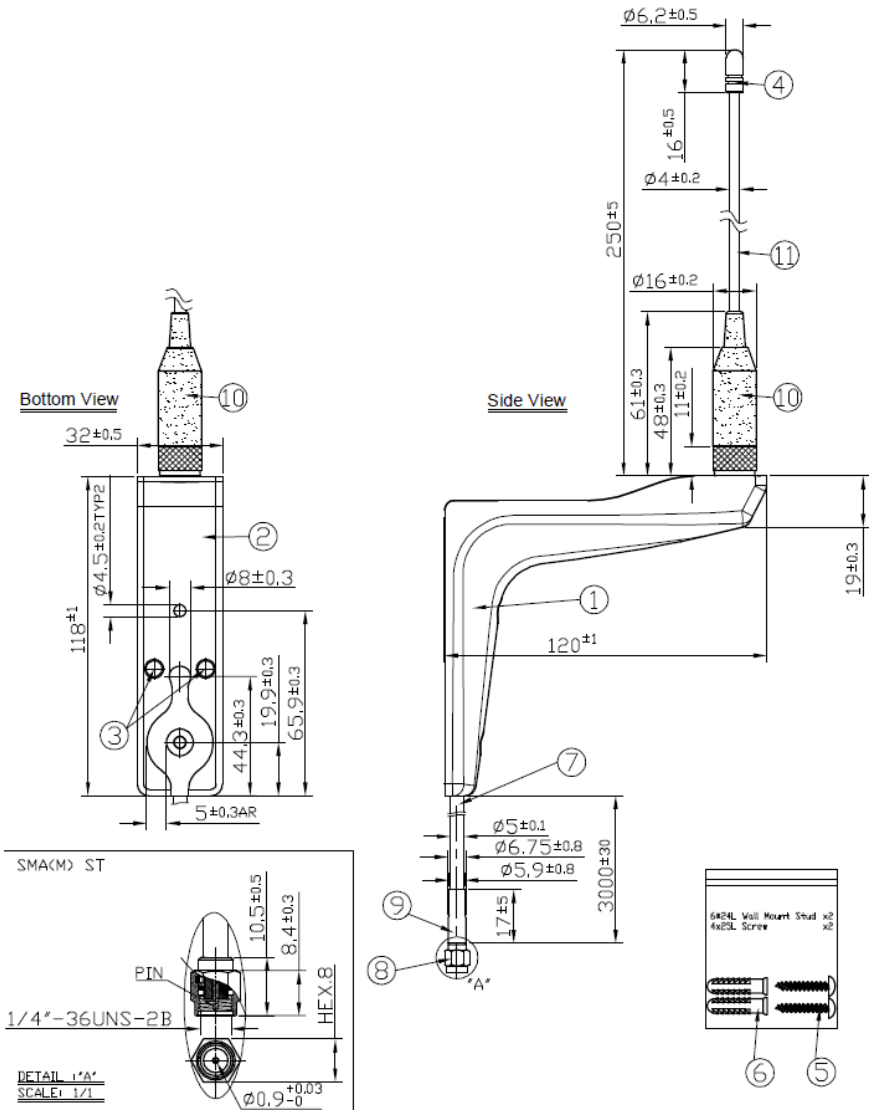


Figure 60
Wall mount antenna drawing dimensions

1	Main bracket
2	Back bracket
3	3”8L screw
4	Cap
5	4”25L screw
6	6”24L wall mount stud
7	CFD 200 cable
8	SMA(M) ST
9	Heat shrink tube
10	Housing
11	Flexible whip

6.6 Outdoor panel antenna drawing dimensions

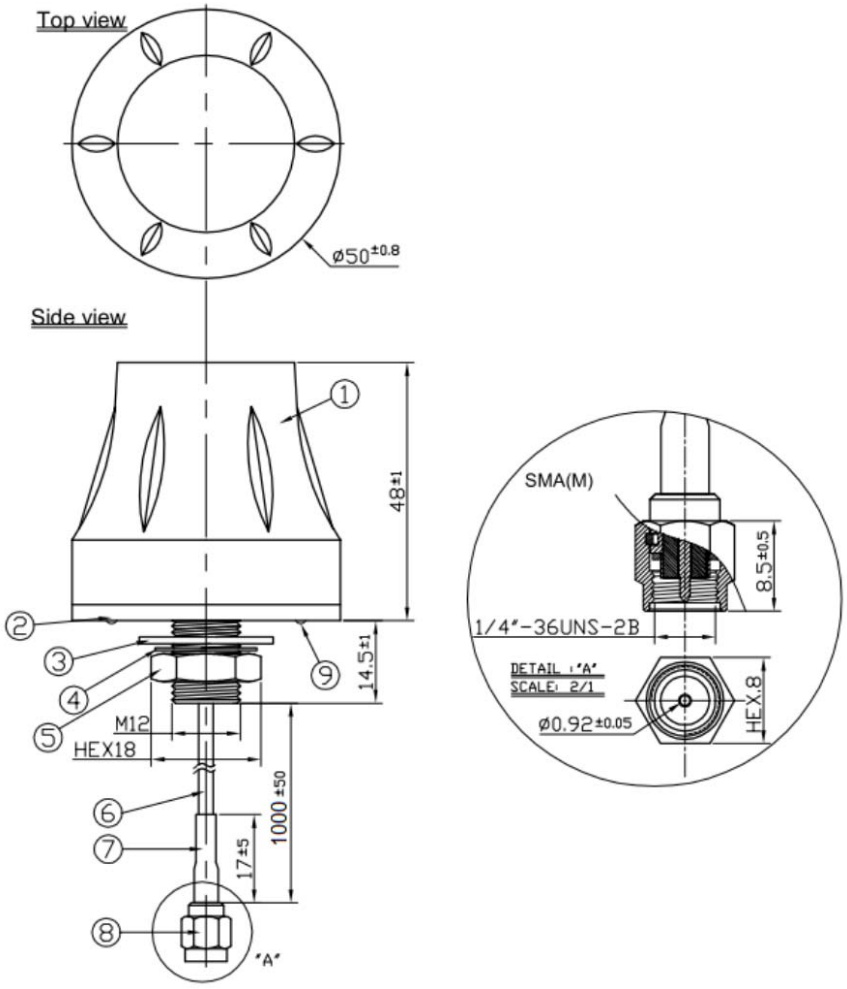


Figure 61
Outdoor panel antenna drawing dimensions

1	Housing top
2	Housing bottom
3	Gasket
4	Multi tooth washer
5	Nut M12
6	RG316
7	Heat shrink tube
8	SMA(M) ST
9	O-ring

6.7 Ports PINOUT

6.7.1 COM1 – DB15M Serial

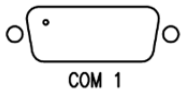


Table 10
COM1 – DB15M Serial

PIN	*Signal*	*I/O*
1	Isolated +5 VDC	OUT
2	Transmit Data (RS-232)	OUT
3	Receive Data (RS-232)	IN
4	Request To Send	OUT
5	Clear To Send	IN
6	Data Set Ready	IN
7	Isolated Ground	—
8	Data Terminal Ready	OUT
9	Carrier Detect	IN
10	Transmit Data +/Receive Data + (RS-485/RS-422)	I/O
11	Transmit Data -/Receive Data - (RS-485/RS-422)	I/O
12	Ring Indication (RS-232)	IN
13	Receive Data + (RS-422)	IN
14	Receive Data - (RS-422)	IN
15	N.C.	—

Any polarization or termination resistor connected to RS422/485 channel, if required, it has to be provided by the user.

6.7.2 Digital In/Out

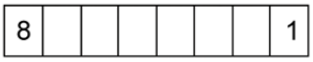


Table 11
Digital In/Out

PIN	*Signal*
1	IN 0 +
2	IN 0 -
3	IN 1 +
4	IN 1 -
5	OUT 0 - A
6	OUT 0 - B
7	OUT 1 - A
8	OUT 1 - B

6.7.3 DC Input

Table 12 DC Input

PIN	***Signal***
1	Vin +
2	Vin -
3	EARTH

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