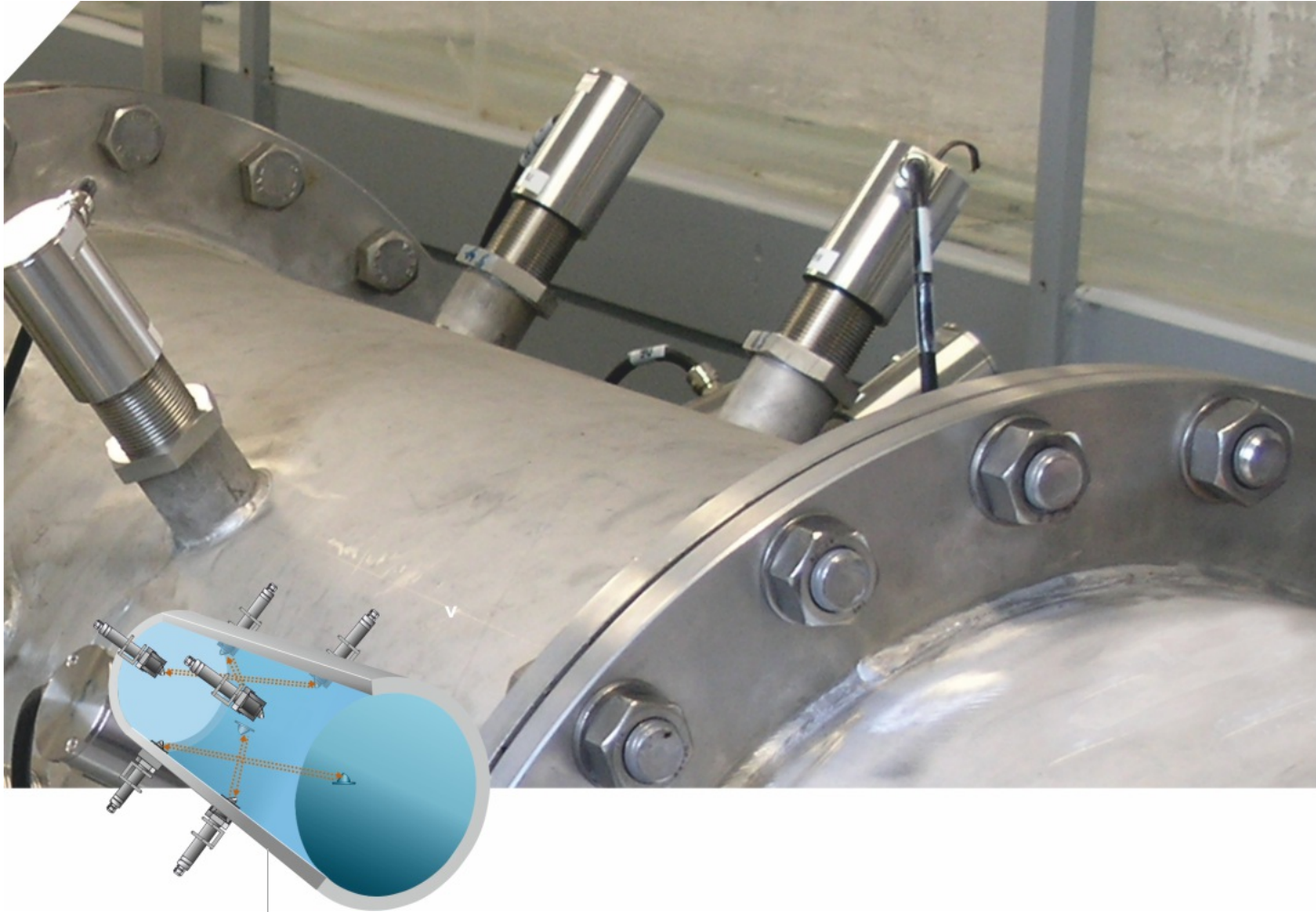




## NivuFlow 600

Transit Time Flow  
Measurement  
in Full Pipes



## Perfect flow measurement in full pipes, insert or clamp-on

The NivuFlow 600 system was developed particularly for flow measurement in full pipes. To meet the highest possible accuracy requirements it is possible to utilise up to 32 velocity paths. There are pipe sensors as well as contactless clamp-on sensors available for the measurement system. It is not necessary to interrupt running processes to install both sensor types. The system is suitable for the detection of flow rates in various liquid media covering a wide range of applications.



## Flow measurement systems at the highest technical level

The compact enclosure can be easily integrated into switching cabinets saving space thanks to DIN rail mounting. Moreover, the NivuFlow 600 units are available in a special field enclosure for use in rough environmental conditions.

The transmitter's large graphic display allows quick and easy commissioning of the flow metering system. It further-

more provides extended diagnostic options and enables in-depth analyses of running processes on site.

Using future-proof protocols and versatile options for communication and connections opens a wide variety of options to operators when it comes to integrate the instruments into higher systems such as SCADA or process conducting systems.

### Your benefits

- Proven ultrasonic transit time measurement
- Single or multi path measurement up to 32 measurement paths with extension modules
- Insert or clamp-on-sensors available
- Easy installation without interruption of running processes
- Easy setup due to guided sensor positioning
- Intuitive, modern operating concept for quick and easy initial start-up
- IP68 weatherproof version for outdoor use available

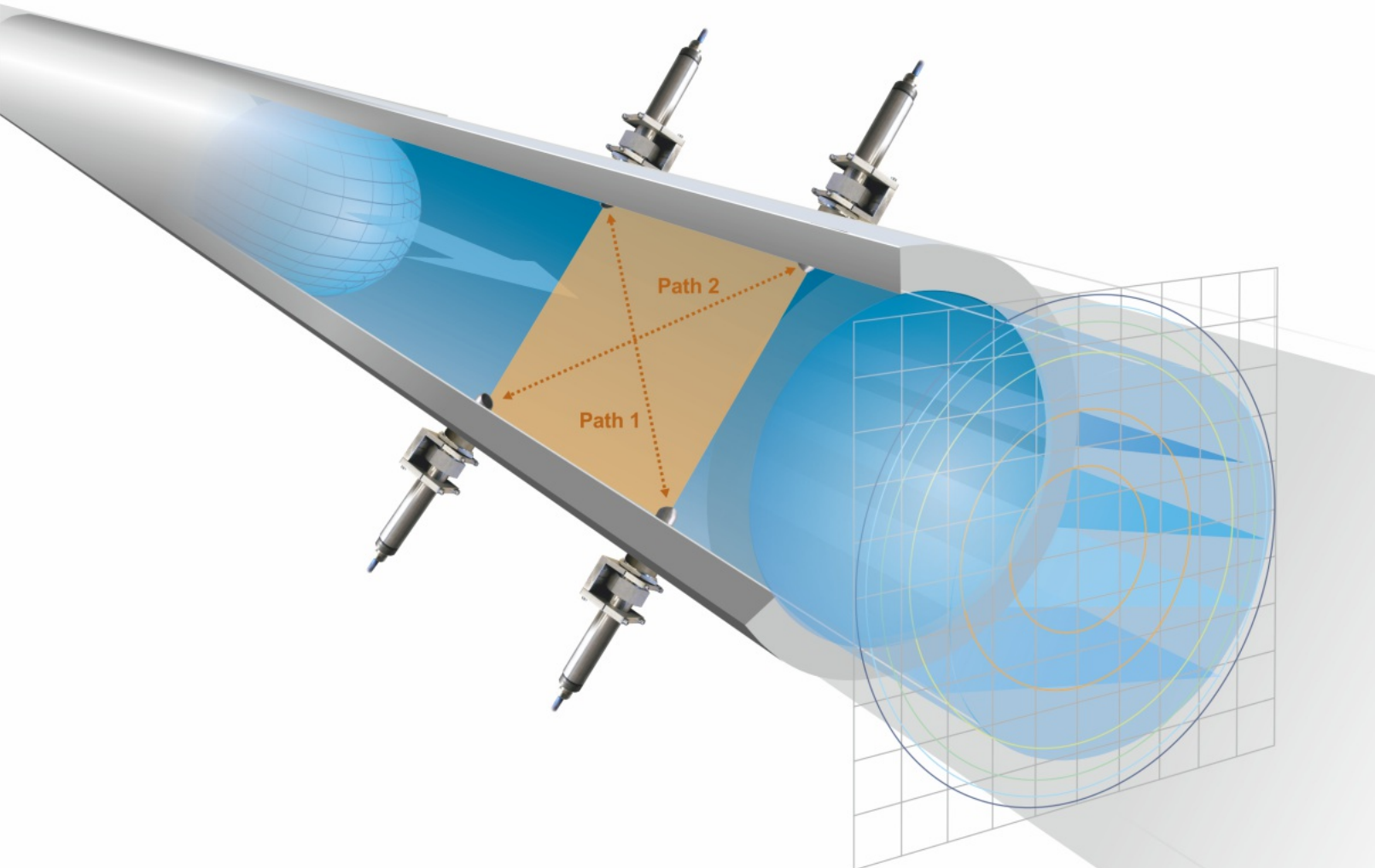


### Typical Applications

Process water in pipes, cooling water and circulation systems, wastewater applications, hydropower plants, drinking water, penstock monitoring, turbine efficiency monitoring

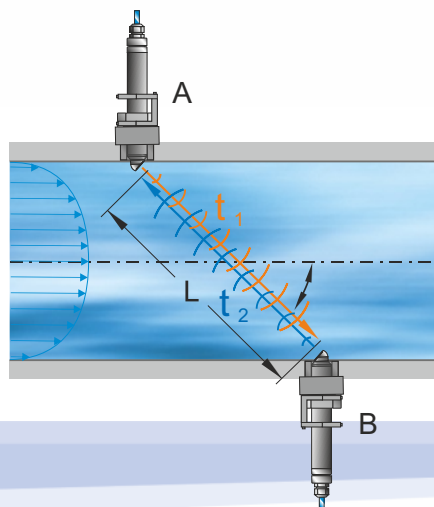


## Transit Time - How the NivuFlow 600 measures



The NivuFlow 600 measurement principle is based on detecting the transit time of ultrasonic signals between two sensors (A and B).

The transit time in flow direction  $t_1$  is shorter than it is against the flow direction  $t_2$ . The difference between both transit times is proportional to the average flow velocity along the measurement path  $v_m$ . The system calculates the average cross-sectional area velocity  $v_A$  from the path velocity  $v_m$  and indicates it directly on the display.



Flow in full pipes is calculated by using the general equation of continuity:

$$Q = A \cdot v_A$$

A = cross-sectional area  
 $v_A$  = average flow velocity in cross-sectional area



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Flow **283.5** l/s

Level **0.430** m Flow velocity **1.578** m/s

Temperature **23.5** °C Sum **311.514** m<sup>3</sup>

500.0 l/s 0.500m 2.500m/s 25.0°C

250.0 l/s 0.000m 0.000m/s 23.5°C

Menu

Screen display main screen

Diagnostics

v-Paths in-/outputs Signal analysis

Simulation

Back

Screen display menu

## The Nivu Flow 600 Transmitter

The intuitive one-hand operation and the bright high-resolution colour display allow quick, easy and cost-efficient commissioning on site. Additional input devices or software are not required.

v-Path 1

Type  
NICO-K1L

Mounting angle **45.00**

Distance along **0.058** m

Back

Screen display measuring place

Measure place

transit time mode **Water on**

Medium  
Water

Channel profile  
Pipe

0.628 m  
0.200 m  
0.188 m  
0.006 m

Back

Screen display channel profile



## The right sensor for your application

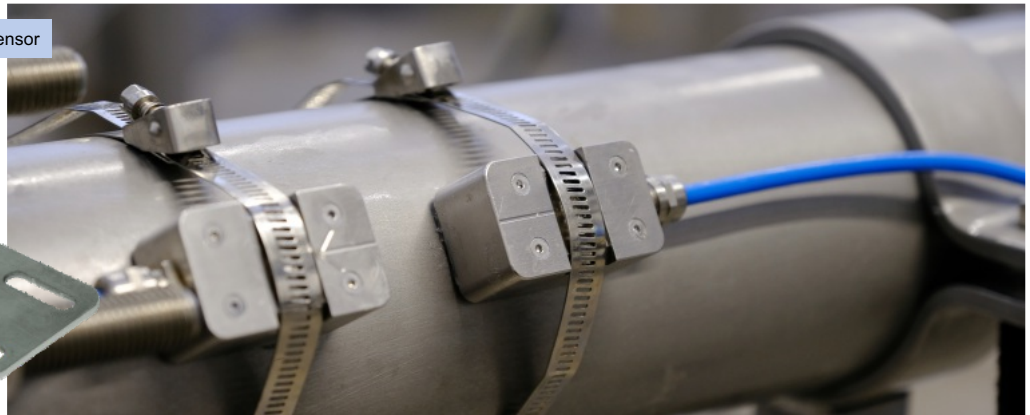
The complete flow measurement system consists of the NivuFlow 600 transmitter and the appropriate sensors for use in full filled pipes.

### Your benefits

- Absolutely zero point stable and drift-free sensors
- Low installation expenses through perfectly matched mounting accessories
- Installation under process conditions
- Various sensor constructions guarantee the best solution for each application
- Digital signal transmission for error-free connections over long distances
- WRAS approved pipe sensors available



Clamp-On-Sensor



Wedge sensor



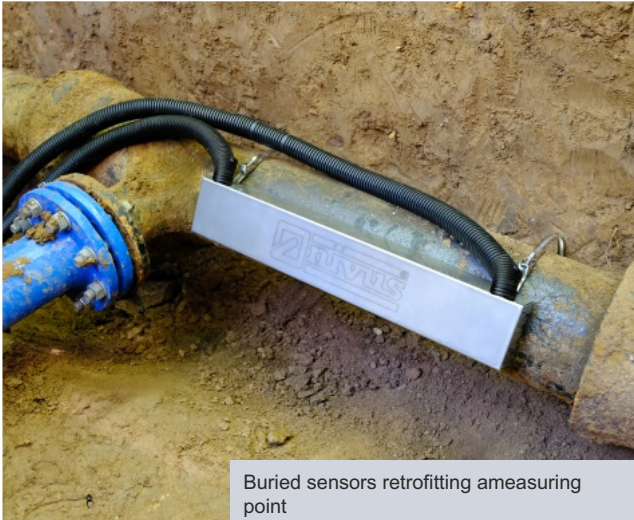
Pipe sensors



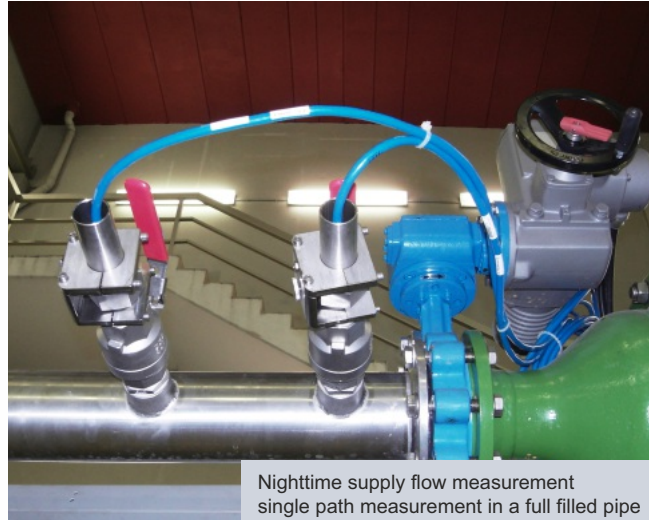
Pipe sensor for use in drinking water



## Perfect solutions



Buried sensors retrofitting a measuring point



Nighttime supply flow measurement  
single path measurement in a full filled pipe



Hydropower plants

## On site from anywhere

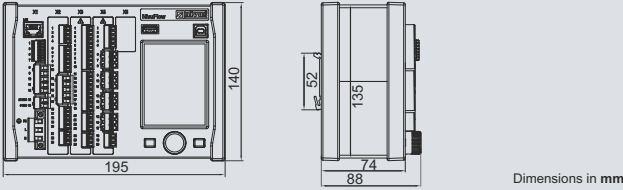
- Integrated data logger for high data security
- Data access worldwide at any time via NIVUS WebPortal
- Online operation and online setting of parameters (remote control)
- Quick and comprehensive remote diagnostics of entire measurement places



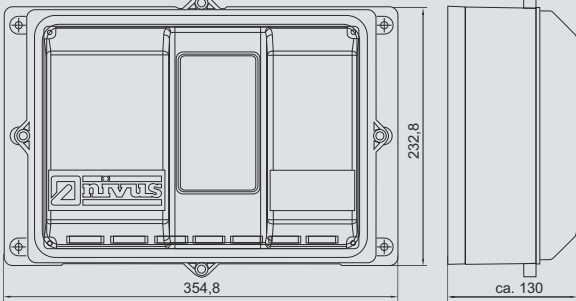
Field enclosure installation

### Transmitter

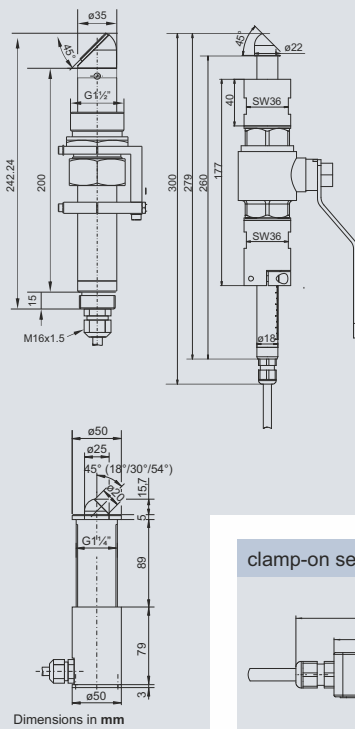
#### DIN rail enclosure for easy installation in switching cabinet



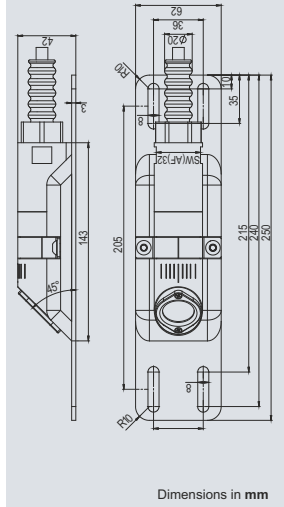
#### Field enclosure



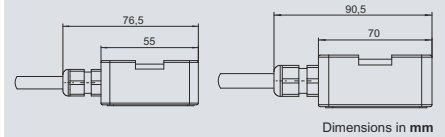
### Pipe sensor



### Wedge sensor



### clamp-on sensors



## Transmitter

Power supply	100 - 240 V AC, -15 % / +10 %, 47 to 63 Hz or 10 - 35 V DC
Power consumption	1 relay energised, 230 V AC: (rounded) 14 W up to 8 sensors transit time 1 Mhz
Enclosure	aluminium, plastic
Weight	approx. 1150 g
Protection	IP 20 (control cabinet), IP 68 (field enclosure)
Operating temperature	DC: -20°C to +70°C AC: -20°C to +65°C
Storage temperature	-30°C to +80°C
Max. humidity	80%, non-condensing
Display	240 x 320 pixel, 65536 colours
Operation	rotary pushbutton, 2 function keys, menus in English, German, French, Swedish ...
Connection	plug with cage clamp terminals
Inputs	2x (Type T2) 4-20 mA, with 12 Bit resolution for storage of data from external units, load 91 Ohm, 2 x (Type T2) digital input
Outputs	2 x (Type T2) 0/4-20 mA, load 500 Ohm, 12 Bit resolution 1x (Type T2) bistable relay SPDT, load up to 230 V AC/2 A (cos 0.9), minimum switching current 100 mA 1x (Type T2) relay SPDT, load up to 230 V AC/2 A (cos j 0.9), min. switching current 100 mA
Data memory	1.0 GB internal memory, readout on faceplate via USB stick
Communication	• Modbus TCP via network (LAN/WAN, Internet) • Modbus RTU via RS485 or Rs232 • Ethernet TCP/IP • 2G/3G/4G via built-in radio comm. modem
Number of paths	1 up to 4 measurement paths up to 32 measurement paths with NivuFlow Extension Module

## Sensor

<b>Measurement principle: Ultrasonic transit time</b>	
Measurement range	flow velocity $\pm 25$ m/s minimum flow velocity: 0.01 m/s
Inner pipe diameter	0.2 m to 12 m (DN200 to DN12000) <b>clamp-on:</b> 0.05 m to 6.0 m (DN50 to DN6000)
Accuracy	Volume flow (Q): $\pm 0.5$ % of measured value with process calibration
Measurement frequency	1 MHz and 500 KHz
Protection	IP 68
Operating temperature	-20° C to +50° C, <b>clamp-on:</b> -40° C to +80° C
Operating pressure	pipe sensor: max. 16 bar (with retaining element)
Cable length	10/15/20/30/50/100 m (extension option: sensors connectable to adapter box, cable length between adapter box and transmitter max. 200 m)
Outer cable diameter	8.5 mm, Clamp-On 7 mm
Sensor types	• pipe sensor with retaining element • wedge sensor with ground plate • Clamp-on-Sensor
Medium contacting materials	• pipe sensor: stainless steel 1.4571, NBR, CFK (Carbon), HDPE • wedge sensor: stainless steel 1.4571, CFK (Carbon)

The specifications above are extracts from the complete documentation. You can find the complete specifications on our instruction manuals.

**NIVUS GmbH**  
75031 Eppingen, Germany  
Phone +49 7262 9191-0  
info@nivus.com  
www.nivus.com

**NIVUS Austria**  
3382 Loosdorf, Austria  
Phone +43 2754 5676321  
austria@nivus.com  
www.nivus.com

**NIVUS France SAS**  
75009 Paris, France  
Phone +33 1 89708767  
info@nivus.fr  
www.nivus.fr

**NIVUS Middle East (FZE)**  
Business Bay Dubai  
Phone +971 4 4580502  
middle-east@nivus.com  
www.nivus.com

**NIVUS Korea Co. Ltd.**  
INCHEON, Korea 21984  
Phone +82 32 2098588  
jhwon@nivuskorea.com  
www.nivuskorea.com

**NIVUS AG**  
8750 Glarus, Switzerland  
Phone +41 55 6452066  
swiss@nivus.ch  
www.nivus.ch

**NIVUS Sp. z o.o.**  
81-035 Gdynia, Poland  
Phone +48 58 7602015  
biuro@nivus.pl  
www.nivus.pl

**NIVUS Ltd., United Kingdom**  
Coventry, CV3 4SU  
Phone +44 1926 632470  
nivusUK@nivus.com  
www.nivus.com

**NIVUS Africa**  
Giza, Ägypten  
Phone +20 2 35393975  
sales@nivusaf.com  
www.nivus.com

**NIVUS Vietnam**  
Bin Hoa City, Vietnam  
Phone +84 94 2623979  
jhwon@nivuskorea.com  
www.nivus.com