

CRITICAL DATA. DIFFICULT ENVIRONMENTS.

RF SOLUTIONS FOR BELOW-GROUND UTILITY CHAMBERS

RF Antennas.
Engineered Around Your Application.

NANO | MARCO POLO | LD

CONNECTING THE INFRASTRUCTURE YOU CANNOT SEE.

Water meters, gas assets, leak loggers and buried monitoring points deliver value only when their data reaches the network. Bloomice brings specialist RF knowledge to the chamber, treating the antenna, cable, mounting and radio as one installed system.

THE CHAMBER CHANGES THE ANTENNA

GOOD COVERAGE ABOVE IS ONLY THE START

A street-level coverage map cannot describe the RF conditions inside a buried chamber. The lid, surrounding materials, installation depth and local metalwork reshape the path between the antenna and the base station.



THE INSTALLED CHAMBER IS PART OF THE RF SYSTEM.

01 / SHIELDING

The lid is an RF boundary

A metal cover can strongly attenuate the direct path. Useful coupling may depend on gaps, frame geometry and the surrounding structure. An open-lid signal test can overstate working performance; verify with the cover fully closed.

02 / LOADING

Water and soil change the link

Wet soil, standing water and damp concrete alter propagation and antenna loading. Pipework and metal fittings can detune the antenna or redirect its radiation. Ground-plane independence does not make an antenna immune to its surroundings.

03 / LINK MARGIN

Efficiency matters at the edge

The radio needs margin above its working sensitivity, not simply a visible signal bar. Installed efficiency, orientation, signal quality and cable loss all contribute. Sub-GHz operation can help coverage, but cannot guarantee a path through a sealed metal chamber.

04 / BATTERY DUTY

Poor RF has an operating cost

A marginal link can mean more retries, longer network attachment and extra coverage repetitions, depending on the radio and network. This can increase energy per delivered report. Assess message delivery and radio activity alongside the battery duty cycle.

TEST THE DATA PATH, NOT JUST THE SIGNAL

Record RSRP, RSRQ and SINR where supported, together with registration, successful uploads and retries. Set acceptance criteria for the actual modem, operator and reporting duty.

BURIED ASSETS. NETWORK-WIDE VISIBILITY.

ONE ENVIRONMENT. MANY CRITICAL USES.

Below-ground connectivity supports much more than consumption readings. The same installation challenge appears wherever a chamber contains a meter, sensor, logger or remote monitoring interface.



01 / WATER

Metering and DMA monitoring

Boundary-box meters, bulk flow measurement and district metered area pressure logging. Dependable uploads support consumption visibility, water balance and pressure management.

02 / LEAK DETECTION

Acoustic and pressure telemetry

Leak-noise loggers, hydrophone interfaces and transient pressure records need reliable data transfer from valve and hydrant chambers. Any GNSS timing requirement needs a separate positioning solution.

03 / GAS

Meter and distribution visibility

Where gas meters or monitoring devices occupy below-surface pits, telemetry can support consumption, pressure and equipment status. Hazardous-area and equipment approvals must be checked for the complete installation.

04 / WASTEWATER

Level, blockage and spill monitoring

Sewer level sensors, rising-main pressure points and overflow event loggers provide early warning and operational evidence. Antenna placement must account for flood levels, fouling and the chamber atmosphere.

05 / DRAINAGE

Flood and culvert intelligence

Stormwater chambers, culverts and attenuation assets can host level, flow and surcharge monitoring. Timely alerts help operators prioritise intervention when heavy rainfall changes conditions rapidly.

06 / DISTRICT ENERGY

Heat-network and buried-asset telemetry

Potential uses include temperature, pressure and leak sensors in suitable district heating or cooling chambers, and ingress monitoring in cable or service vaults. Qualify each site and radio architecture.

Application opportunities are subject to device compatibility, radio-band matching and site qualification. These cellular antennas do not provide GNSS or every sub-GHz mesh/LoRa band.

SELECTED AROUND THE INSTALLATION

NANO. MARCO POLO. LD 5G/LTE.

Three rugged, omni-directional, ground-plane-independent formats give the installer practical choices in footprint, height and radio coverage. Select against the chamber geometry and the working network bands.

NANO LTE

BM-02055

A COMPACT FOOTPRINT FOR BOUNDARY BOXES

When a meter, valve and logger compete for space, the antenna must fit without becoming an afterthought. NANO brings a 127 mm maximum base diameter to boundary-box and chamber installations. Its rugged housing and customer-specified cable and connector help create a repeatable fit for new meter programmes or retrofit telemetry. The installation still needs clearance from the lid and metal fittings, with performance verified in the final position.

97.5 mm high x 127 mm max. base diameter | IP67 / IK09
 LTE cellular bands | LL100 low-loss cable | VSWR <= 2:1



MARCO POLO LTE

BM-02029

A LOWER PROFILE FOR DEMANDING WATER CHAMBERS

Where vertical clearance is limited but a broader mounting footprint is available, MARCO POLO offers a 75 mm high water-chamber format. Its 194 mm base and fixing provision support a secure installation, while customer-specified cable length and connectors allow the antenna position to be considered separately from the logger. It is a strong starting point for flow, pressure and leak-monitoring projects that need an installation-led cellular solution.

75 mm high x 194 mm base diameter | IP67 / IK09
 LTE cellular bands | LL100 low-loss cable | VSWR <= 2:1



LD 5G / LTE

BM-02070

A NARROW BODY-MOUNT FORMAT WITH WIDER RADIO OPTIONS

The LD provides a 57 mm base diameter for installations where lateral space is constrained. Its PC/ABS enclosure and ZAMAK base suit a rugged body-mount approach, with LL195 low-loss cable, length and connector specified around the device. Alongside the stated cellular bands, 3300-4000 MHz coverage gives an additional 5G NR option where the network and chamber conditions support it. Radio compatibility and the installed link remain the deciding factors.

122 mm overall height x 57 mm base diameter | IP67 / IK09
 Cellular + 3300-4000 MHz 5G NR | LL195 cable | VSWR <= 2.3:1



FROM SPECIFICATION TO REPEATABLE DEPLOYMENT

POSITION. CONNECT. SEAL. VALIDATE.

The best antenna choice is the one that works in the complete installation. Bloomice helps turn chamber constraints into a practical RF configuration, with evidence that can be carried into the rollout.

FLEXIBLE MOUNTING FOR DIFFICULT CHAMBERS

MARCO POLO, NANO and LD can all be mounted below ground. Depending on the chamber and cover, the antenna can be fixed to a bracket or suspended from a steel manhole cover using a high-strength neodymium magnet.



MAGNET SUSPENDED

A short chain suspends the antenna beneath a steel cover. The strong, removable fixing avoids drilling the cover.



BRACKET MOUNTED

A defined position and controlled cable route where the cover is non-magnetic or chamber space is constrained.



FIELD INSTALLATION

Depth, cover, cable route and equipment position all matter.

01 / POSITION

Find the viable coupling path

Compare candidate positions close to the surface where access allows. Bracket, body or suitable suspension arrangements should preserve orientation, lid clearance and service access. Specify any magnetic or bracket accessories separately and validate their mechanical load.

02 / CABLE

Protect the available link margin

Keep cable as short as practical and assess attenuation at the actual operating bands. Cable loss rises with length and usually with frequency. Select connector type, strain relief, bend radius and routing together; the supplied plots do not represent a long field cable.

03 / SEALING

Design for real exposure

All three antennas offer IP67 and IK09, with a -40 to +85 C operating range. An antenna rating does not establish continuous submerged operation or protect every cable joint. Confirm expected flood duration, connector sealing and the complete assembly.

04 / NETWORK

Match bands and operating duty

The stated frequency ranges are 700-960, 1710-1880, 1920-2170 and 2300-2655 MHz. LD adds 3300-4000 MHz. Check LTE-M, NB-IoT or LTE modem bands against these ranges and local operator service; technology names alone do not establish compatibility.

A PRACTICAL QUALIFICATION ROUTE

Agree success criteria. Compare positions. Close the lid. Complete real uploads. Review radio quality and energy duty. Repeat on representative difficult sites before standardising the installation.

Interpreting the datasheets: NANO and MARCO POLO were measured with a 300 x 300 mm ground plane and 500 mm LL100 cable; LD was measured in free space with 500 mm LL195 cable. These are reference test conditions, not a chamber-performance guarantee. Hazardous gas or sewer locations require approval of the full equipment and antenna configuration; no ATEX/IECEx certification is stated in the supplied antenna sheets.

SPECIALIST KNOWLEDGE. GLOBAL PERSPECTIVE.

COMPLEX RF CHALLENGES. PRACTICAL SOLUTIONS.

Supporting major blue-chip organisations worldwide with an application-led approach to difficult wireless environments.



CREDIBILITY BUILT AROUND THE REAL INSTALLATION

Since 2001, Bloomice has helped customers address demanding RF and connectivity requirements. For below-ground utilities, that means understanding the chamber, the equipment and the network together - then selecting a configuration that can be evaluated, documented and deployed consistently.

TECHNICAL DEPTH

More than component selection

Antenna selection, integration guidance, cable configuration and RF optimisation bring the complete application into focus. Early technical engagement helps identify constraints before a field programme is committed.

TECHNOLOGY COLLABORATION

Recognised within the ecosystem

Bloomice collaborates with Telit Cinterion commercial and technical teams, including the pre-compliance specialists in Trieste. The recognised partner status supports informed module and antenna integration.

BRING US THE CHAMBER, THE DEVICE AND THE OPERATING DUTY

Share the lid and chamber materials, dimensions, mounting space, radio bands, operator, cable route, flood exposure and reporting requirements. We will help define the antenna and a meaningful evaluation route.

RF ANTENNAS. ENGINEERED AROUND YOUR APPLICATION.

Discuss your below-ground utility project with Bloomice.

