KOMPLEX®

MARKING AND LOCATING UNDERGROUND NETWORKS

V.2.24

ABOUT US

ISO 9001:2015

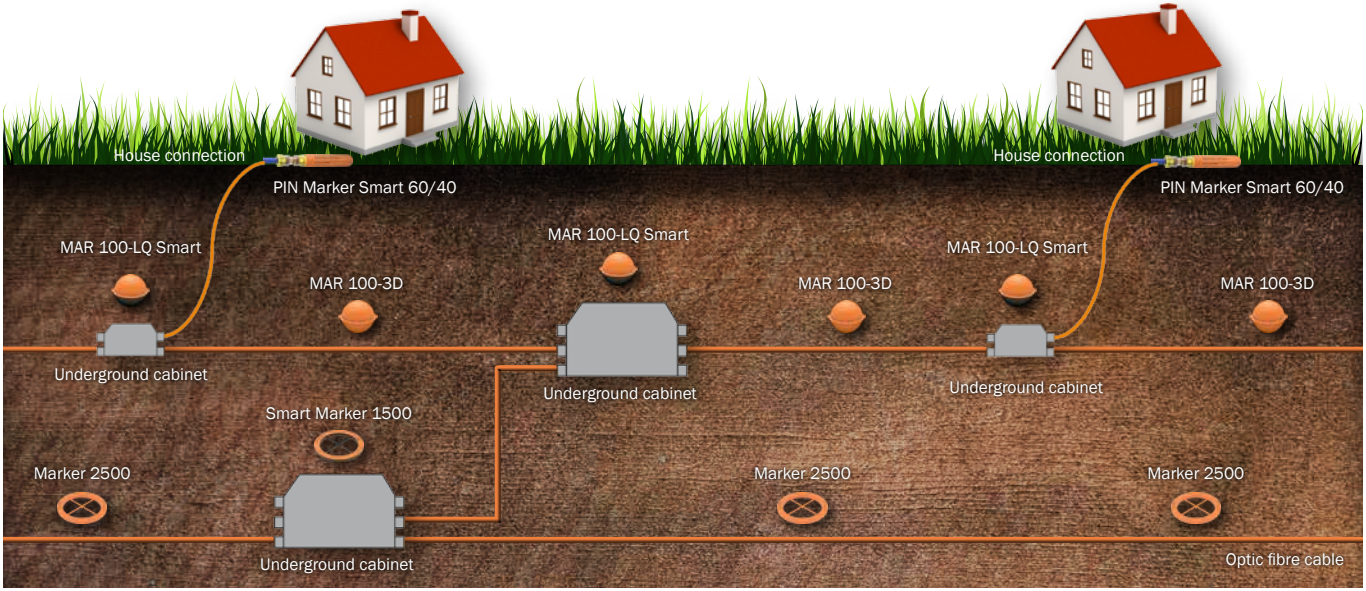
The company Komplex, s. r. o. was founded in 1994 by Ing. Štefan Sivák. Since its establishment, the company has specialised in the development and manufacture of radio frequency systems for the marking and setting out of underground utilities. Thanks to our professional approach and innovative thinking, today we operate in more than 20 countries and are one of the world leaders in the field of underground utility marking.

UNDERGROUND MARKERS AS AN IDEAL SOLUTION

The construction of underground utilities, reconstruction of existing utilities, or other activities requiring excavation works pose a risk of damage to underground utilities, which may result in damage to property, the environment, or the health of workers in the field.

Inaccurate documentation, lack of information on the location of networks, inappropriate marking systems, plastic pipes or other non-metallic materials of underground utilities are all factors that increase the risk of damage to networks.

Underground markers from Komplex® are the ideal solution for reliable and unambiguous marking of all types of utility lines. Combined with the SML Locator and Marker Database® software, they form a comprehensive and unique system for marking and setting out your utility network.



UNDERGROUND MARKERS

How do they work?

The underground markers contain a passive magnetic antenna tuned to a precise resonant frequency. Markers do not contain any energy source. They use only the energy received from the retrieval device to operate. This allows each marker to work reliably without any maintenance for many decades.

Plastic marker covers are made of high-strength plastics that guarantee their resistance to mechanical and chemical damage.

Markers are placed underground during construction or repair, above the utility points they are intended to mark. Locating the marker is done by electromagnetic communication with the locator. This allows any type of utility network to be marked with the marker, regardless of the material of which the network is made.

KOMPLEX® PRODUCE TWO TYPES OF UNDERGROUND MARKERS

▸ Analog markers

▸ Smart markers

SMART RFID SYSTEM
– smart even underground

The Smart RFID System is a comprehensive intelligent system designed for the marking and detection of underground utilities.

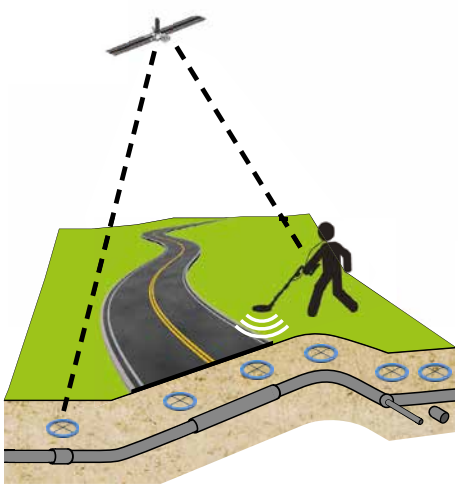
It consists of the following parts:

- Underground markers
- SML Locator
- Marker Database® software

Why choose the Komplex® Smart RFID System?

- Lifetime of data stored in Smart Marker: min. 50 years
- Creating user text information for each Smart Marker
- Edit all underground network data from the comfort of your office
- Built-in GPS module in every SML Locator
- Acoustic GPS navigation
- Display Smart Markers on Google maps®
- Detailed processing and archiving of all your underground network data in the unique Marker Database® software
- Archiving your data in the Cloud
- Securely share data with your partners using the Marker Database® web service

SMART MARKERS
with ID number



Smart Markers from Komplex® are worldvide unique markers with a pre-programmed ID number. They are designed for permanent unambiguous marking of the selected point of the utility network.

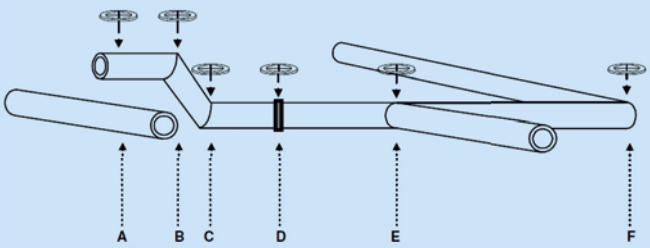
In addition to the direct sections of the underground network, the following strategic points of the network can be marked with Smart Markers:

- Connection
- Crossing with another network
- Branch, branching network
- Changing the direction of the network
- Changing the depth of the network
- Underground shaft, manholes etc.

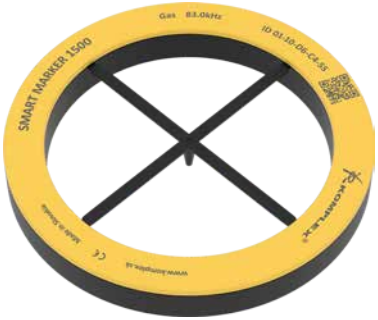
The following information can be assigned to Smart Markers using the locator or Marker Database® software:

- GPS coordinates of the Smart Marker's location
- Smart marker user text information
- Marker serial number

All information is always linked to a specific Smart Marker ID number. This provides the user with accurate data about the placement of their underground utility.



A Intersection with other pipelines
B Changing the depth of the pipe fi tting
C Changing the depth of the pipe fi tting
D Join, place of repair, place of the action in the pipeline
E Pipe branch connection
F Change of direction



Smart Marker 1500

It is a flat underground marker with a pre-programmed ID number. It is designed for applications at greater depths.

Its design gives it a reading range of up to 1.7 m for ID number detection.

MAR 100-LQ Smart

It is a spherical underground marker with a pre-programmed ID number. It is suitable for narrower excavations.

Its greatest advantage is that it can be placed underground in any position. It is the ideal solution for marking all strategic points of the utility network. The robust outer PE casing provides it with high resistance to mechanical damage and gives it protection even under the harsdest conditions. Two holes on the sides of the marker cover are designed for possible attachment of the MAR 100-LQ Smart to the cable or pipe by means of fixing strips.

PIN Marker Smart 60/40

It is a small size stick underground marker with a pre-programmed ID number. The design of the PIN Marker provides the possibility of its detection in both vertical and horizontal positions.

For optical networks, the PIN Marker Smart 60/40 is designed so that it can be directly attached to a 7/4 mm microduct using an optical coupler. It can be attached to other diameters using reducers.

In other applications, it is ideal for marking important points at shallow depths

ANALOG MARKERS

Analog radio frequency markers are passive electrical devices designed to permanently mark of underground utilities. They provide reliable marking of less important points and direct sections of all types of underground utilities.

MAR 100-3D

MAR 100-3D is a spherical underground marker designed for narrower excavations. The biggest advantage of the MAR 100-3D is the spherical characteristic of its electromagnetic field. This greatly simplifies the installation of this marker. The MAR 100-3D's robust outer PE casing provides it with high resistance to mechanical damage and gives it protection even in the harshest conditions. The two holes on the sides of the marker cover are for the eventual attachment of the MAR 100-3D to the liner by means of fixing strips.

MAR 100-LQ

MAR 100-LQ is a self-leveling underground marker designed for narrow excavations. The biggest advantage of the MAR 100-LQ is the self-leveling construction. This greatly simplifies the installation of this marker. The robust outer PE casing provides high resistance to mechanical damage and gives the protection even in the harshest conditions. The two holes on the sides of the marker cover are for the eventual attachment of the MAR 100-LQ to the liner by means of fixing strips.

PIN Marker 130/100

It is a stick underground marker of small dimensions. The design of the PIN Marker provides the possibility of its detection in both vertical and horizontal positions.

For optical networks, the PIN Marker 130/100 is designed so that it can be directly attached to a 7/4 mm microtube using an optical coupler. It can be attached to other sizes of microtubes using reducers.

In other applications, it is ideal for marking important points at shallow depths.

Long Marker

A flat Long Marker designed for deep excavations. It has the advantage of a long reading range. The new marker design allows the marker to be used up to a depth of 2.5 m. It is intended to be used for marking of less important points of the underground utilities in bigger depths.

Marker 2500

It is a flat underground marker for universal use where marking of important points is not required. The Marker 2500 is designed to mark utility lines at a maximum depth of 1.8 m. In the past, the Marker 2500 was the most widely used method for marking all types of underground networks.

MiM Marker 120

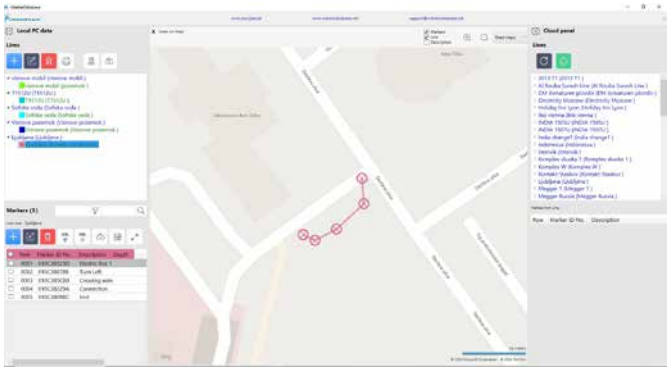
MiM Marker 120 analog is a passive analog marker designed for the permanent marking of the underground facilities. The external diameter of the markers is only 12 cm which means that the MiM Marker 120 analog can be used in the narrowest trenches or in the places with bad access. MiM Marker 120 analog represents the cost friendly and reliable way of marking all types of the underground facilities where the exact and clear detection is needed.

MARKER DATABASE® SOFTWARE

Marker Database® software is the globally unique software for managing and processing data about your underground networks.

It provides the following advantages:

- Viewing both markers and underground networks on Google Maps®
- Adding photos to routes and markers
- Receiving data from the SML Locator
- Sending data to the SML Locator
- Editing and managing data about your underground networks and markers
- Sharing data about your underground networks and markers with your partners around the world
- Printing data



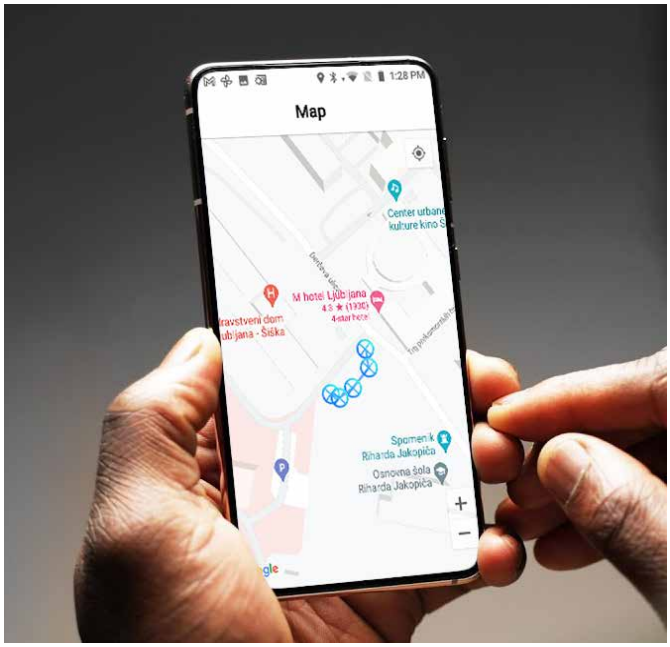
MARKER® database

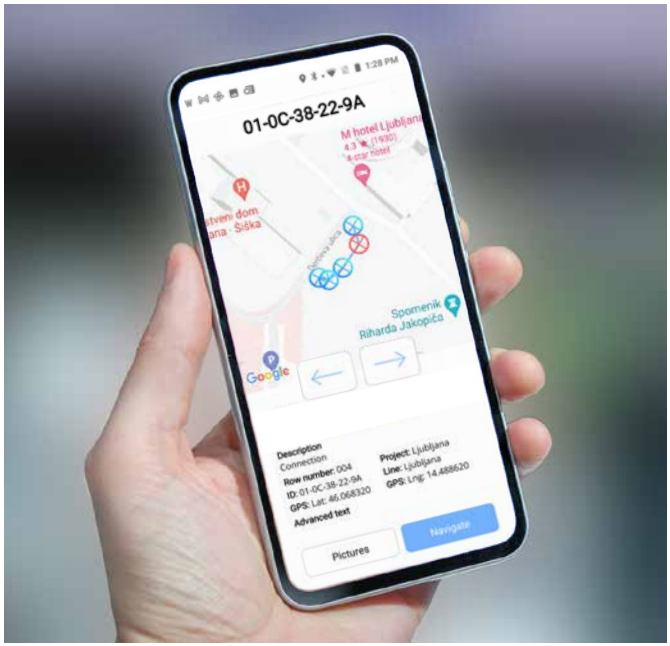
Marker Database® mobile app

Marker Database® is the world's first mobile app that allows you to find the location of your underground network using your mobile phone.

It provides the following functions:

- Data transfer between your mobile phone and the web server
- Editing your marker and route data directly in the field
- Showing marker routes on the map
- GPS navigation with your phone to the desired marker
- Adding photos to markers and routes





MARKER® database

SML 2 LOCATOR

SML 2 is completely new and innovative type of locator for detecting of underground markers.

SIM card slot, inbuilt camera, 2D scanner for reading of the ID numbers in barcode, GPS navigation or touch screen menu, this all is combined in our SML2 to provide you the best machine for detecting of underground markers on the market.

Detecting of RFID Smart Markers, adding pictures and text information to each marker or wireless transfer data to Marker Database® software is absolutely easy and joiable.

Displaying
of markers
on Google map

Detecting
of Komplex®
Smart Markers

Laser reader
for ID QR codes

KEY FEATURES:

1. Detecting of Komplex® Smart Markers
2. Inbuilt camera
3. Inbuilt GPS navigation
4. Laser 2D reader for ID QR codes
5. Realtime communication with server
6. Offline working mode
7. Displaying of markers on Google map
8. High resolution touch screen
9. Cell phone functions
10. Web browser
11. Adjustable antenna bar
12. Removable cell phone control unit
13. Wireless Bluetooth® communication
14. Wi-Fi
15. Marker Database® software support

SML 2

MARKER® database

TECHNICAL SPECIFICATIONS SML 2

Operating system	Android
CPU	Octa-core 1.8 G Hz
Memory	Min. 16 GB Flash/4 GB RAM
Expansion	Micro SD card slot
SIM/SAM	2 SIM slots and 1 SAM slot
Working hours	Min. 12 hours
Operating power	Rechargeable 3.8 V 4 000 mAh Li-ion battery/3.75 V 5 300 mAh Li-ion battery
Wireless communication	WWAN (2G, 3G, 4G), WLAN, WPAN, Bluetooth®
GPS	Built-in GPS, AGPS, GLONASS, BeiDou, Galileo
Barcode scanning	2D imager/ Mid-range 2D imager
Camera	Autofocus 13 megapixels (F2.0)
Display	4.7" HD 720 (W) x 1 280 (H); capacitive touch supports bare/wet/ gloved finger and stylus inputs
Operating frequency* *For each frequency is necessary to connect correspond antenna	83.0 kHz, 101.4 kHz, 121.6 kHz, 139 kHz, 145.7 kHz
Weight *(Locator with one antenna)*	Max. 2,5 kg
Adjustabel length of antenna bar	Yes: 85-116 cm
Package contents	SML2 – 1 pc Industrial mobile – 1 pc Removeale Loop Antenna – 1 pc Charger for SML2 – 1 pc Charger for IM – 1 pc Transport bag – 1 pc
37 x 90 x 26 cm (W x L x H)	Max. 7 kg

TECHNICAL PARAMETERS

Smart Marker SM1500

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7
Top cover material	High Density PS
Dimensions *(diameter x height)*	225 x 28 mm
Weight	Max. 300 g
Serial ID number	YES, 10-digit hexadecimal code
Marker reading range	1.7 m
Operating temperature	-20 °C to +60 °C
Marker lifetime including data	50 years

MAR 100-LQ Smart

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7
Top cover material	PE
Dimensions	Diameter 130 mm
Weight	Max. 450 g
Serial ID number	YES, 10-digit hexadecimal code
Reading range marker analogue/ID	1.7 m/1.0 m
Operating temperature	-20 °C to +60 °C
Marker lifetime including data	50 years

PIN Marker 60/40 Smart

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7
Top cover material	PE
Dimensions *(max. diameter x height)*	17 x 100 mm
Weight	Max. 30 g
Serial ID number	YES, 10-digit hexadecimal code
ID reading range *(vertical/horizontal)*	0.6 m/0.4 m
Reading range analogue *(vertical/horizontal)*	1.3 m/1.0 m
Operating temperature	-20 °C to +60 °C
Marker lifetime including data	50 years

MAR 100-LQ

Operating frequency (kHz)	66,35 | 77,0 | 83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	PE
Dimensions	Diameter 130 mm
Weight	Max. 435 g
Serial ID number	NO
Marker reading range	1.5 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

MAR 100-3D

Operating frequency (kHz)	66,35 | 77,0 | 83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	PE
Dimensions	Diameter 130 mm
Weight	Max. 210 g
Serial ID number	NO
Marker reading range	1.5 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

MiM Marker 120

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	High Density PS
Dimensions *(diameter x height)*	119 x 33 mm
Weight	Max. 116 g
Serial ID number	NO
Marker reading range	1.4 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

Marker 2500

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	High Density PS
Dimensions *(diameter x height)*	225 x 28 mm
Weight	Max. 300 g
Serial ID number	NO
Marker reading range	1.8 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

Long Marker

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	High Density PS
Dimensions *(diameter x height)*	225 x 28 mm
Weight	Max. 300 g
Serial ID number	NO
Marker reading range	2.5 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

PIN Marker 130/100

Operating frequency (kHz)	83.0 | 101.4 | 121.6 | 134.0 | 145.7 | 169.8
Top cover material	PE
Dimensions	17 x 100 mm
Weight	Max. 30 g
Serial ID number	NO
Reading range analogue *(vertical/horizontal)*	1.3 m/1.0 m
Operating temperature	-20 °C to +60 °C
Marker lifetime	50 years

TYPES OF UNDERGROUND NETWORKS AND THE CORRESPONDING MARKERS

83,0 kHz	Gas pipelines		SML G
101,4 kHz	Telecommunication cables		SML T
121,6 kHz	Sewage pipelines		SML S
134,0 kHz; 169,8 kHz	Energy cables		SML E
145,7 kHz	Water pipelines		SML W

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