



Robot Inspection and Calibration System  
**ROBINCA**



Foto: Forsvaret

# ROBINCA

Robot Inspection & Calibration System

*Robinca is a portable and versatile measurement system for assessment of pitting, erosion and general wear of gun barrels. It combines visual inspection with highly accurate non-contact measurement technology.*

## High Resolution

Robinca features reliable Fogale Sensor technology that combine visual inspection with high resolution and accurate diameter measurements. This complies with standards provided by the barrel manufacturers and operating organization such as TDV018.

Capacitive sensors provide an almost unlimited accuracy (it “sees the first molecule”) and can be specified to measure at micron level. The Robinca system is designed for an accuracy of 5µm, and repeatability better than 1µm. The sensors are solid and contain no moving parts. They are rugged and durable, and are not easily affected by ambient conditions.

## Modular Nature

The Robinca system is compounded of modules and the software contains all relevant gun bores. By switching between caliber specific components, one main unit can be utilized for all gun bores. The modular nature of the system provides increased versatility and cost savings. For the time being the system ranges from 4,6mm rifle barrel to 155mm howitzer. Software user-interface is uniform through the complete range.

## Report Generation

The Robinca system automatically generates reports for statistics and analyses instantly after a measurement procedure. The operator can choose between several types of report formats. All measurement data can be imported into the Gun Barrel Management System (GBMS), a database for further analysis.

*Operational configuration management*

*Reduced barrel life cycle costs*

*Increased target precision*

*Better planning and barrel life estimation*

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## Benefits

### Safety

Robinca contributes to safety for investments and personnel by discovering developing degradation and by this reducing the risk for accidents. The system contributes to maintain operational precision by improved exit velocity prediction. Robinca reduces the risk of phasing out systems with remaining barrel life or overuse of worn barrels.

### Operational availability

- Provide forecasts for the next service call-in time, so that this can be coordinated with other service needs. This will provide better operational availability and lower maintenance costs.
- Display pipe quality and lifecycle status per operational unit for assessment against production requirements and planned activities.

### Optimization of use

- Rank the gun barrels according to remaining fatigue life and hit quality to ensure to equip personnel for a mission with the very best equipment the organization has available.

### Maintenance & Service optimization

- Support the workshops with measurement data, history, and visualization that can improve the execution and quality of the measurements.
- Enable the workshops with insight of use of weapons to schedule time for the next gun barrel measurement depending on tolerances and shooting results.

### Lifetime calculation & budget support

- Based on consumption of ammunition and measured wear & tear compared with measurement certificates, a calculation of the remaining lifetime of a gun barrel, residual value and estimated time for replacement based upon stock removal or new purchases.

### Procurement & negotiation support

- Actively use during testing of new, current weapon systems to verify that the supplier’s wear and life calculations are correct.
- Calculate own operating and purchasing costs based on measurement results.
- Use acquired knowledge to adjust the quality and design of gun barrels and associated equipment.
- Use acquired knowledge to adjust price and delivery requirements.
- Use lifetime calculations on existing weapon systems measured against equipment in stock, as input to the operating and investment budget.

Qualifying gun barrels

Maintain safety

Conditioning monitoring

Automatic report generation



Foto: Forsvaret

# Robinca 155mm measurement system

Robinca is a portable and versatile measurement system for assessment of pitting, erosion and general wear of gun barrels. It combines visual inspection with highly accurate non-contact measurement technology. The measurement system complies with standards provided by the barrel manufacturers and operating organization, such as TdV018.

Capacitive sensors provide an almost unlimited accuracy (it "sees the first molecule") and can be specified to measure at micron level. The Robinca system is designed for an accuracy of 5µm, and repeatability better than 1µm. The sensors are solid and contain no moving parts. They are rugged and durable and are not easily affected by ambient conditions.



Condition monitoring of 155mm gun barrel includes diameter measurement, visual inspection and area calculation of findings. The Robinca system ensures an effective automatic condition monitoring process.

The measurement procedure includes predefined measurement positions, and the crawler automatically transport the measurement head to each positions. At each position the system performs a diameter measurement automatically. After the last predefined position the system returns back into the launcher. The Robinca software instruct the operator during the entire process.

The report is saved continuously during the entire measurement sequence. It is possible to save a PDF or excel file including raw data.

## Description of use

The Robinca measurement probe is inserted into the muzzle end of the barrel by means of a launcher. Visual inspection is performed utilizing a rotating colour camera equipped with internal lights. The measurement unit is moved into the barrel by a crawler, and then automatically positioned at each predefined measuring point.

At the measurement positions, the capacitive sensors collect measurement data from the barrel. Average measurement accuracy is better than +/-5 microns. Repeatability is +/-1 micron.

Stored data can be displayed and reports is automatically generated from the software.

## Technical specification

### Robinca 155mm measurement head

Length:	532mm
Weight:	9,5kg
Diameter:	Ø154,5mm
Material:	Anodized aluminium
Colour:	Black

### Diameter measurement

Technology:	Capacitive sensors
No. of sensors:	8
Accuracy mm:	±0,005mm
Accuracy mm:	±0,020mm
Resolution:	±0,001mm

Calibration ring and certificate

# Robinca control unit & software

The Robinca system is robust and does withstand many years of normal use. Based upon our experience the life expectancy of the Robinca system is more than 20 years.

The Control Unit is compund of a Laptop and a MCU Datalogger. All implemented in a smart transport box with wheels and an extractable handle.

Setup of the system is quick and easy where the Control Unit is connected to the measurement head and the crawler with a 20m cable ensuring power, signal transfer and gas pressure. The gas pressure is needed to press the capacitive sensors as close as possible against the gun barrel wall to gain best possible measurement accuracy. In addition the Control Unit provides power to the position laser.



The Robinca software supports all gun barrels. The operator can create adapted inspection procedures based upon the tolerances for each gun barrel. Through customized guidelines the software can confirm any diameter measurement deviation. The software instructs the operator each step during the measurement procedure.

The Robinca system detect wear, bulges, burnup and other damages inside a gun barrel that may expose personnel to shooting accidents. Discovering shooting and hit deviations that could put a combatant at risk during a sharp mission does matter.



## Technical specification

### Robinca Control unit

Items:	Laptop & Datalogger
Dimensions:	565 x 355 x 241mm
Weight:	12kg
Colour:	Black

### Robinca software

Operating system:	Windows 11
Type of calibre:	Big, Medium and Small
Type of measurement:	Diameter measurement Groove by groove Scan of a section
Report format:	csv, xml, PDF, Html





# Robinca 120mm measurement system

This system is used for assessing smooth bore Leopard 2 Gun Barrel. It combines visual inspection with non-contact measurement methods.

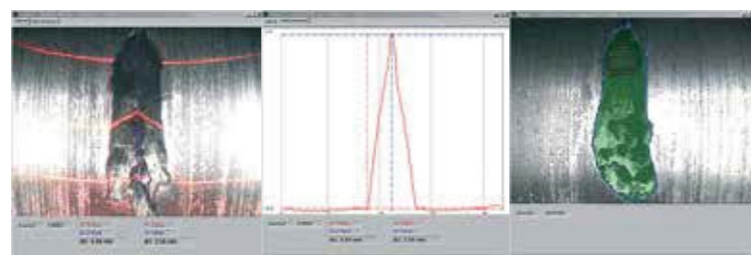
According to standards supplied by the barrel manufacturers and/or operating organizations, diameter increase, pitting depth and damaged area of chromium plating must be documented. In order to comply with these standards the measurement head is equipped with laser line deflection as well as capacitive sensors.

The Robinca 120mm measurement system consists of a camera, a crawler and a measurement head. The camera and the crawler are connected to the 120mm Robinca measurement head and assembled into the launcher.

The complete assembly is mounted by snap-on clamps onto the muzzle end of the barrel. All cables are connected to the control unit. Area measurement is carried out in the BCSOFT software.



The system provides the possibility to perform either barrel and chamber measurement or only either one of the two. The measurement data are automatically stored in data files and visualized as tables and graphs.



### Description of use

The Robinca measurement probe is inserted into the muzzle end of the barrel by means of a launcher. Visual inspection is performed utilizing a rotating colour camera equipped with internal lights. The measurement unit is moved into the barrel by a crawler, and then automatically positioned at each predefined measuring point. At the measurement positions, the capacitive sensors collect measurement data from the barrel. Average measurement accuracy is better than +/-5 microns. Repeatability is +/-1 micron. Stored data can be displayed and reports is automatically generated from the software.

Foto: Alom/ Forsvaret

### Technical specifications

#### Robinca 120mm measurement head

Length:	380mm
Weight:	9kg
Diameter:	Ø119,6mm
Material:	Anodized aluminium
Colour:	Black

#### Diameter measurement

Technology:	Capacitive sensors
No. of sensors:	8
Accuracy 119-122mm:	±0,005mm
Accuracy 122-126mm:	±0,020mm
Resolution:	±0,001mm

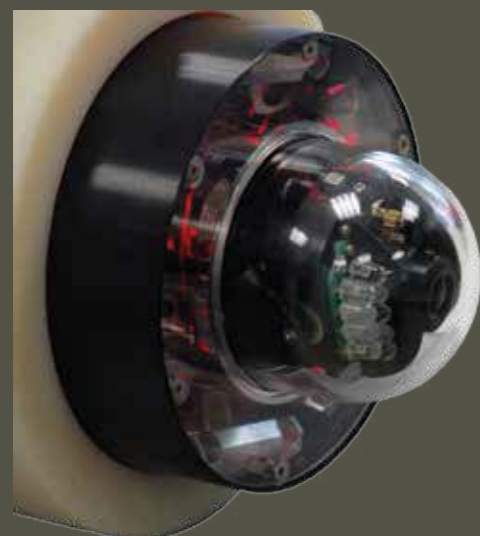
#### Calibration ring and certificate

#### Depth measurement

Technology:	Laser line deflection
Accuracy 0-7mm:	±0,050mm
Resolution:	±0,005mm

#### Camera

Specifications: See page 9



# Robinca 120mm chamber measurement head

This system measures 8 predefined cross-sections in a chamber, as specified in the barrel manufacturer handbook.

Caseless ammunition requires a higher focus on the chamber. An increased diameter larger than 0,05 mm in the rear end should not be allowed according to standard.

Rolling balls situated all the way around the probe body ensures easy and safe insertion and rotation, either in the calibration ring or in the chamber.

The measurement probe is rotated manually according to instructions from the software. Pictures can be imported into the report.



A certified calibration ring is included. The purpose of this calibration ring is to set the correlation between the capacitive measurement and millimeters prior to a measurement sequence.

### Description of use

Robinca measurement head is inserted into the chamber at rotation 0 degree. The probe has to be turned manually as instructed by the software. At the predefined measurement positions, the capacitive sensors collect measurement data from the barrel. Average measurement accuracy is better than +/-20 microns. Repeatability is +/-1 micron. Stored data can be displayed and reports is automatically generated from the software.



### Technical specification

#### Robinca 120mm chamber measurement probe

Length:	737,7mm
Weight:	13kg
Diameter:	Ø158,0mm
Material:	Anodized aluminium
Colour:	Black dim

#### Diameter measurement

Technology:	Capacitive sensors
No. of sensors:	16
Accuracy 119 (+4/-0)mm:	±0,020mm
Accuracy 158 (+4/-0)mm:	±0,020mm
Resolution:	±0,002mm

#### Calibration ring and certificate





## Robinca 105mm measurement system

Robinca is a portable and versatile measurement system for assessment of pitting, erosion and general wear of gun barrels. It combines visual inspection with highly accurate non-contact measurement technology. The measurement system complies with standards provided by the barrel manufacturers and operating organization, such as TdV018.



Condition monitoring of 105mm gun barrel includes diameter measurement, visual inspection and area calculation of findings. The Robinca system ensures an effective automatic condition monitoring process.

The measurement procedure includes predefined measurement positions, and the crawler automatically transport the measurement head to each positions. At each position the system performs a diameter measurement automatically. After the last predefined position the system returns back into the launcher. The Robinca software instruct the operator during the entire process.

The report is saved continuously during the entire measurement sequence. It is possible to save a PDF or excel file including raw data.

### Description of use

The Robinca measurement probe is inserted into the muzzle end of the barrel by means of a launcher. Visual inspection is performed utilizing a rotating colour camera equipped with internal lights. The measurement unit is moved into the barrel by a crawler, and then automatically positioned at each predefined measuring point. At the measurement positions, the capacitive sensors collect measurement data from the barrel. Average measurement accuracy is better than +/-5 microns. Repeatability is +/-1 micron. Stored data can be displayed and reports is automatically generated from the software.

### Technical specification

#### Robinca 105mm measurement head

Length:	532mm
Weight:	6,6kg
Diameter:	Ø104,7mm
Material:	Anodized aluminium
Colour:	Black

#### Diameter measurement

Technology:	Capacitive sensors
No. of sensors:	8
Accuracy mm:	±0,005mm
Accuracy mm:	±0,020mm
Resolution:	±0,001mm

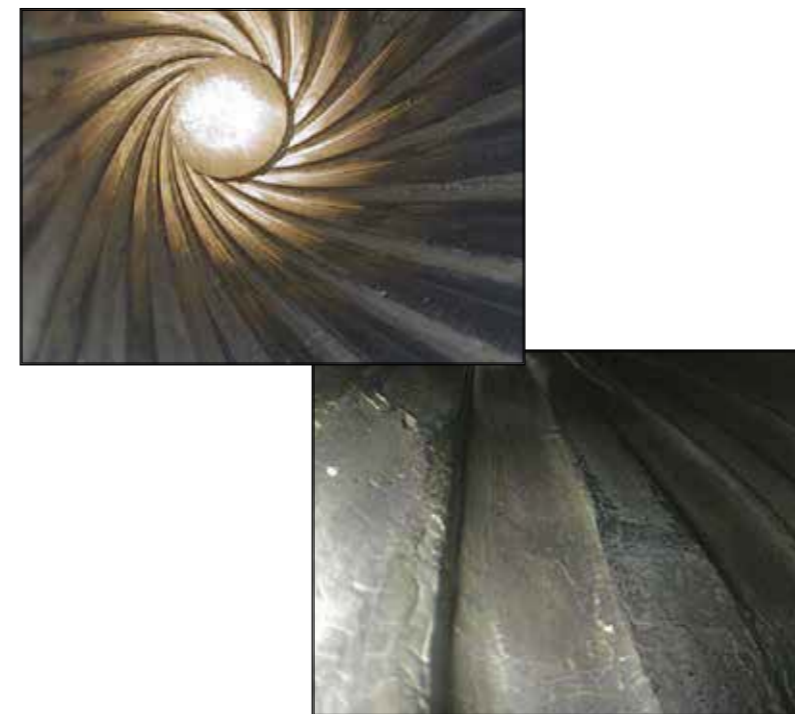
Calibration ring and certificate

## Robinca 30mm measurement probe

The probe is manually fed into the barrel by extendable rods. This system measures caliber and groove diameters. A fixed tape measure indicates longitudinal position.

According to requirements set by the barrel manufacturers and/or operating organization, potential diameter increase must be assessed and documented. In order to comply with these requirements the measurement head is equipped with capacitive sensors.

The measurement data are automatically stored in data files and visualized as tables and graphs. By use of a VideoProbe pictures can be saved and imported into the Robinca report.



### Description of use

Before initiating the Robinca measurement, we recommend to carry out the visual inspection by use of the VideoProbe. Robinca is inserted into the muzzle end of the barrel by extendable rods resting in a tripod mounted crib. The probe is pushed and rotated in the barrel manually according to instructions from the QtBCS software. At the selected measurement positions, the capacitive sensors collect measurement data from the barrel.



### Technical specifications

#### Robinca 30mm measurement system

Length incl. extension rods:	2 660mm
Weight incl. extension rods:	19kg
Diameter, measurement head:	Ø29,9mm
Material, measurement head:	Stainless steel

#### Diameter measurement

Technology:	Capacitive sensors
No. of sensors:	4
Accuracy @ 0,5mm:	±0,005mm
Accuracy @ 1,2mm:	±0,050mm

Calibration ring and certificate



Foto: AL/ Forsvaret



Foto: Alom/ Forsvaret

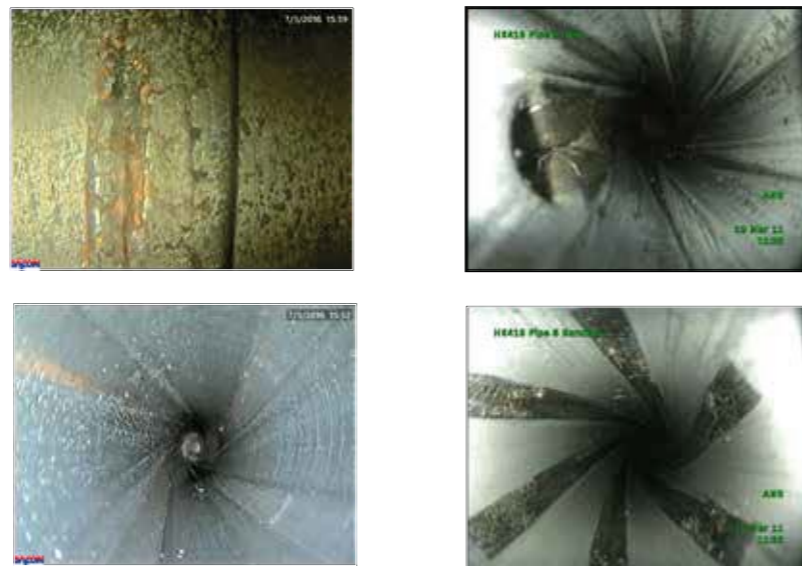


# Robinca small caliber

The measurement probe is manually fed into the barrel by a single rod. This system measures the diameter on top of each caliber and down into each groove. A fixed tape measure indicates longitudinal position.

According to requirements set by the barrel manufacturers and/or operating organization, potential diameter increase must be assessed and documented. In order to comply with these requirements the measurement head is equipped with capacitive sensors.

The measurement data are automatically stored in data files and visualized as tables and graphs. By use of a VideoProbe pictures can be saved and imported into the Robinca report.



## Description of use

Before initiating the Robinca measurement, we recommend to carry out the visual inspection by use of the VideoProbe. Robinca is inserted into the muzzle end of the gun by a single rod. The probe is pushed and rotated in the barrel manually according to instructions from the QtBCS software. At the selected measurement positions, the capacitive sensors collect measurement data from the barrel.

## Technical specification

### Robinca 12,7mm measurement probe

Length: 1220mm  
 Diameter: Ø12,5mm  
 Caliber, accuracy mm: ±0,010mm  
 Groove, accuracy mm: ±0,030mm

### Robinca 7,62mm measurement probe

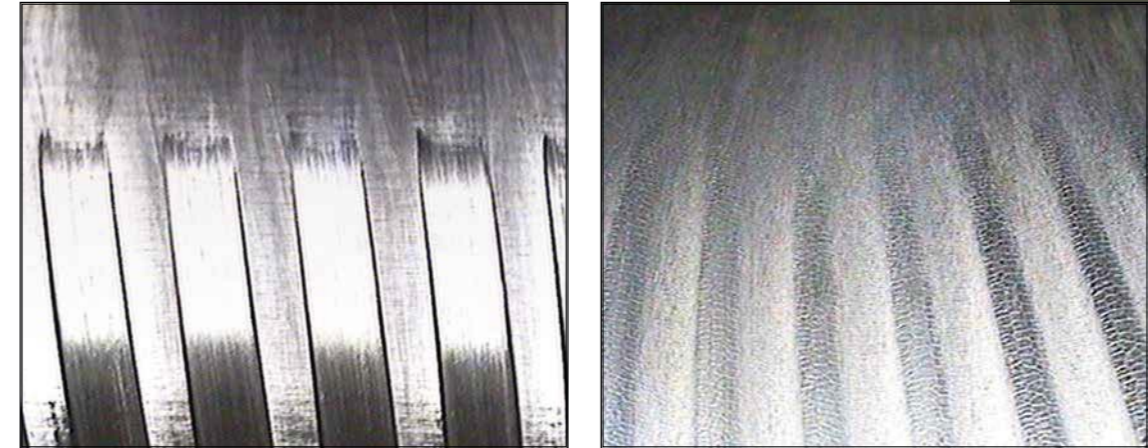
Length: 1000mm  
 Diameter: Ø7,5mm  
 Caliber, accuracy mm: ±0,010mm  
 Groove, accuracy mm: ±0,030mm

### Robinca 5,56mm measurement probe

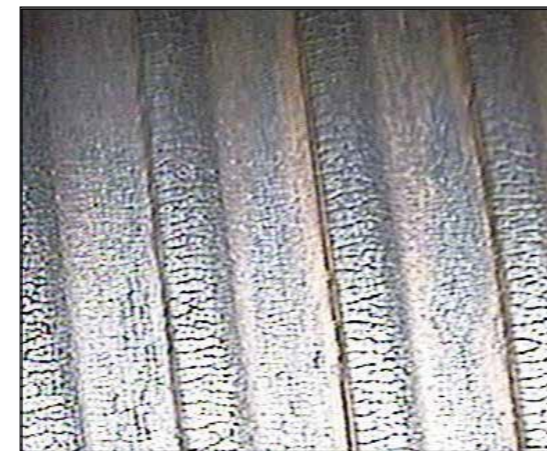
Length: 800mm  
 Diameter: Ø5,4mm  
 Caliber, accuracy mm: ±0,010mm  
 Groove, accuracy mm: ±0,030mm

Calibration ring and certificate

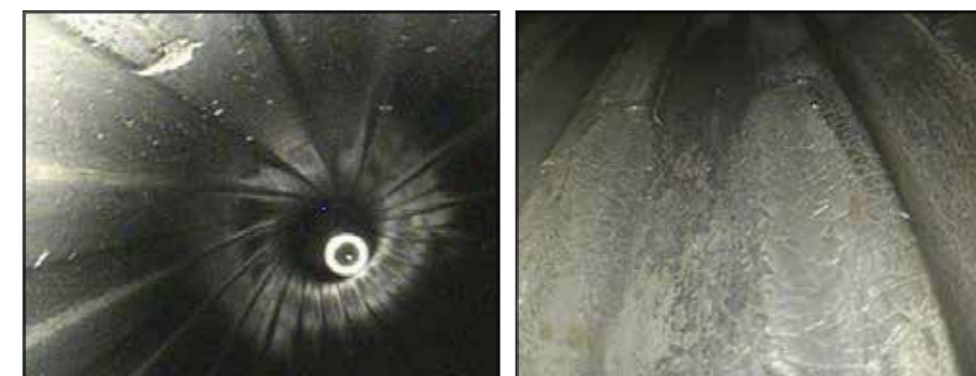
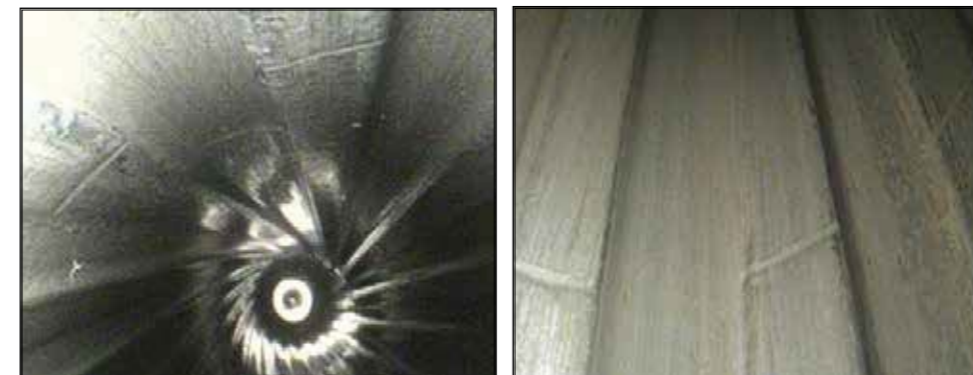
# Examples of findings



Same 155mm cannon barrel - brand new and towards wear life time



155mm cannon barrel - copper deposits



30mm cannon barrel - detonation inside

## Everest Mentor Visual iQ+ VideoProbe

Visual inspections by use of the VideoProbe can detect indications that helps an operator to make good decisions in condition monitoring of gun barrels, engines or turbines.

The Everest Mentor Visual iQ+ (MViQ+) VideoProbe is our most advanced portable, connected digital flexible boroscope with 3D Measurement and remote wireless collaboration. It accurately detects visual findings such as corrosion, cracking, pits and tearing-off parts of a caliber or chromium. This is the only video borescope that features voice-activated commands, making it possible to freeze-frame live video, increase dark boost, save an image, and more - without the need for an extra hand.

A full selection of interchangeable probes with standard and measurement optical tips are designed to meet diverse application requirements.

The MViQ+ combines portability with powerful processing. It meets a variety of inspection needs with interchangeable probes and tip optics. The touchscreen interface enables faster navigation, precise cursor placement, and on-screen typing and annotation to speed up inspections. Designed and tested to recognized civilian and military standards (IP65, MIL-STD-810H and MIL-STD-461G), the device is dependable in the field. And at just 6.75lbs with a lithium-ion battery, the aircraft compliant MViQ+ stores in overhead compartments for easy mobility.

With Wi-Fi enabled Bluetooth keyboard and headset, inspectors of all levels can work together instantly. Inspectors will be able to share screens and images, gather opinions and even make notes in real time with Inspection Connect—no matter the environment or distance between them.

The images can easily be imported into a Robinca report.



### Technical specification

#### Mentor Visual iQ+ VideoProbe

Weight: From 3,0 kg  
 Diameter probe: Ø4.0mm, 6.1mm, 8.4mm  
 Waterproof: 1 bar  
 Image sensor: 1/6" Color superHAD CCD camera  
 Pixel Count: SD or HD format  
 Housing: Titanium  
 Power: Lithium Ion Battery, 10.8V

Hard button/joystick interface: Yes  
 IP65/MIL-810 field durability & ruggedness: Yes  
 QuickChange battery pack: Yes  
 Connectivity: Yes  
 • Wi-Fi/Bluetooth  
 • Network drive mapping  
 • InspectionWorks-ready  
 Comparison Measurement: Yes  
 Model can be upgraded: Yes  
 40/80/160GB SSB internal memory: Yes

QuickChange probes: Option  
 Touchscreen interface: Option  
 Real3D measurement: Option  
 Stereo measurement: Option  
 Probability of Detection Suite: Option  
 iView Remote for streaming & control: Option  
 Voice control: Option

## Everest Mentor Flex VideoProbe

The Everest Mentor Flex is a digital video borescope with fixed insertion tube. Complete inspections with unrivaled TrueSight™ image clarity, housed on a large 5.8" WXGA (Wide XGA) LCD screen with Gorilla® Glass. Industry-leading light output means clearer images and more accurate assessments.

With mounting demand to get inspections done quicker and cheaper, without compromising the accuracy of the results, most equipment can't withstand the pressure. Combining portability with military-grade durability, the Everest Mentor Flex answers the call with the features you always wished you'd had for the tasks that demand it — all to help you make smart decisions, fast.

With an upgraded articulation design founded on high-power steering motors, the Everest Mentor Flex allows technicians to effortlessly navigate even the most challenging inspection paths, resulting in less time spent searching and more time spent capturing and analyzing indications — at a fraction of the time and cost.

Constructed with military-grade magnesium housing (MIL-STD) and tested by a third party to withstand the rigors of the industrial workplace, you can trust your Everest Mentor Flex borescope to deliver top performance in even the harshest environmental conditions.

Standard compliance and classifications are MIL-STD-810H and MIL-STD-416G.



### Technical specification

#### Everest Mentor Flex VideoProbe

Weight: From 2.5 kg  
 Diameter probe: 3.9mm, 4.0mm, 6.1mm, 8.4mm  
 Waterproof: 1 bar  
 Image sensor: 1/6" SuperHAD™ CCD camera  
 Pixel Count: 440 000 pixels  
 Housing: Titanium  
 Power: 3h Lithium Ion Battery

Hard button/joystick interface: Yes  
 MIL-STD-810H compliant: Yes  
 MIL-STD-461G compliant: Yes  
 IP rating: IP65  
 QuickChange battery pack: Yes  
 Internal memory: 32GB

QuickChange probes: Option  
 Touchscreen interface: Option  
 Real3D measurement: Option  
 Stereo measurement: Option  
 Probability of Detection Suite: Option  
 iView Remote for streaming & control: Option  
 Voice control: Option

# Small caliber report

**BCS result file**  
 Barrel station : 17 / 0 Chamber station : 0 / 0  
 Pictures : 10 Laser Measures : 0  
 Max diameter : 7.884 Min diameter : 7.601



Software Revision : QdBCS 1.2.0.26 Date : 20160928  
 Operator : Halvard Heimlund Measurement type : station\_per\_station  
 NATO stock number :  
 Vehicle registration number :  
 Shots count :

**Tube**  
 Ref: tube\_762  
 ID: 0033  
 Length : 330mm  
 Tube Diameter : 7.62mm  
 Groove Diameter : 0mm  
 Groove Count : 4

**Probe**  
 Ref: small\_caliber  
 ID : S1571  
 Layout : mcuframe

**Stations (17)**

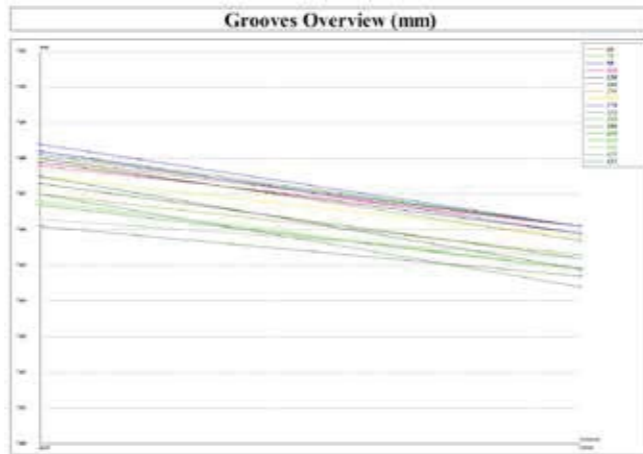
Position (mm)	Radius Mode	Groove Mode	Station Number
60.00	tube centered view	groove per groove radius	1
75.00	tube centered view	groove per groove radius	2
90.00	tube centered view	groove per groove radius	3
110.00	tube centered view	groove per groove radius	4
130.00	tube centered view	groove per groove radius	5
160.00	tube centered view	groove per groove radius	6
190.00	tube centered view	groove per groove radius	7
230.00	tube centered view	groove per groove radius	8
270.00	tube centered view	groove per groove radius	9
310.00	tube centered view	groove per groove radius	10
350.00	tube centered view	groove per groove radius	11
390.00	tube centered view	groove per groove radius	12
410.00	tube centered view	groove per groove radius	13
413.00	tube centered view	groove per groove radius	14
416.00	tube centered view	groove per groove radius	15
419.00	tube centered view	groove per groove radius	16
422.00	tube centered view	groove per groove radius	17

## Kalibers Overview (mm)

Station (mm) / Angular position (degree)	0.0°	90.0°
60	7.63	7.62
75	7.64	7.64
90	7.63	7.63
110	7.64	7.63
130	7.64	7.63
160	7.64	7.63
190	7.62	7.61
230	7.64	7.63
270	7.64	7.63
310	7.62	7.60
350	7.65	7.63
390	7.63	7.62
410	7.74	7.71
413	7.75	7.74
416	7.71	7.69
419	7.75	7.73
422	7.80	7.79

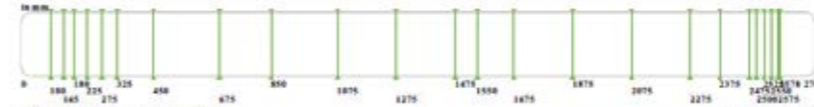
## Grooves Overview (mm)

Station (mm) / Angular position (degree)	45.0°	135.0°
60	7.88	7.86
75	7.88	7.86
90	7.88	7.86
110	7.88	7.86
130	7.88	7.86
160	7.88	7.86
190	7.87	7.85
230	7.88	7.86
270	7.88	7.86
310	7.86	7.85
350	7.88	7.86
390	7.87	7.85
410	7.87	7.85
413	7.87	7.85
416	7.86	7.85
419	7.87	7.84
422	7.88	7.85



# Medium caliber report

**BCS result file**  
 Barrel station : 24 / 0 Chamber station : 0 / 0  
 Pictures : 14 Laser Measures : 0  
 Max diameter : 31.303 Min diameter : 30.036



Software Revision : QdBCS 1.2.0.12 Date : 20161125  
 Operator : Halvard Heimlund Measurement type : station\_per\_station  
 NATO stock number :  
 Vehicle registration number :  
 Shots count :

**Tube**  
 Ref: ref\_30  
 ID : 04330261  
 Length : 2700mm  
 Tube Diameter : 30mm  
 Groove Diameter : 0mm  
 Groove Count : 16

**Probe**  
 Ref: small\_caliber  
 ID : PRO Z 027p30A  
 Layout : mcuframe

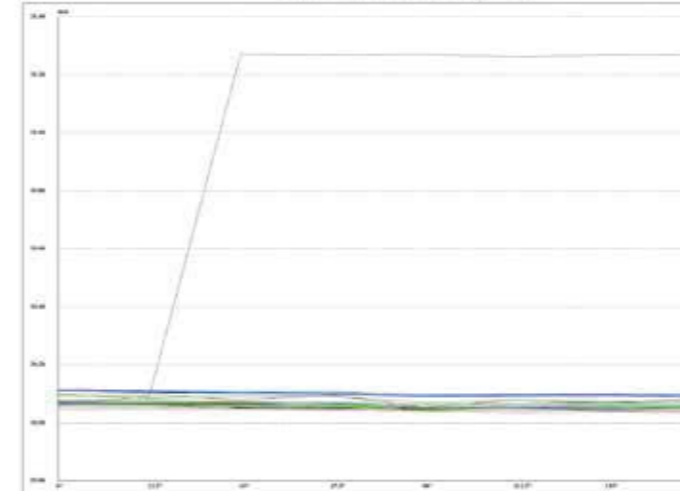
**Stations (24)**

Position (mm)	Radius Mode	Groove Mode	Station Number
100.00	tube centered view	groove per groove radius	1
145.00	tube centered view	groove per groove radius	2
180.00	tube centered view	groove per groove radius	3
225.00	tube centered view	groove per groove radius	4
270.00	tube centered view	groove per groove radius	5
315.00	tube centered view	groove per groove radius	6
350.00	tube centered view	groove per groove radius	7
395.00	tube centered view	groove per groove radius	8
440.00	tube centered view	groove per groove radius	9
485.00	tube centered view	groove per groove radius	10

## Grooves Overview (mm)

Station (mm) / Angular position (degree)	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
100 mm	31.25	31.25	31.25	31.19	31.18	31.20	31.18
145 mm	31.23	31.24	31.23	31.18	31.19	31.17	31.19
180 mm	31.22	31.22	31.25	31.22	31.25	31.22	31.22
225 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
270 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
315 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
350 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
395 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
440 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
485 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
530 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
575 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
620 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
665 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
710 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
755 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
800 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
845 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
890 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
935 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
980 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1025 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1070 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1115 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1160 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1205 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1250 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1295 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1340 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1385 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1430 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1475 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1520 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1565 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1610 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1655 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1700 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1745 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1790 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1835 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1880 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1925 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
1970 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2015 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2060 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2105 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2150 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2195 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2240 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2285 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2330 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2375 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2420 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2465 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2510 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2555 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2600 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2645 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2690 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2735 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22
2780 mm	31.22	31.22	31.22	31.22	31.22	31.22	31.22

## Kalibers Overview (mm)



## Tolerances

30mm bushmaster  
 $\Delta 25: 30.036 + 0.08\text{mm}$   
 $0 - 75\text{mm}: 30.01 + 0.065\text{mm}$   
 Grooves:  $31.4 \pm 0.105\text{mm}$





# GBMS database & software

## Gun Barrel Management System

Gun Barrel Management System (GBMS) is a database and analysis software that collects and contains measurement data from the Robinca system or other measurement tools. GBMS compiles management data from measurement data and displays the data for decision making. GBMS provides interface to other military records.

This is to support the Armed Forces service organization and weapon experts in their assessment and evaluation of condition and quality of the individual weapon system or the global fleet. Safety and operational availability will improve and maintained in the best possible way by not exceeding tolerances. Wear and damage can be detected before they cause accidents or provide poor performance during a mission.

Every gun barrel measurement tool generates a lot of measurement data. To be able to save measurement data and analyze the information, the Gun Barrel Management System database is vital.

In an informative and well-arranged way GBMS makes measurement data from the Robinca system or other measurement tools available. It combines the measurement data with Defence organization data and material to support the service organization of the Armed Forces and weapon experts in their assessment and evaluation of the quality and condition of the individual tubes or of the total fleet.

It also provides functionality to compare inspections over time for the same barrel – including pictures – and compare inspections from different barrels. It stores all the inspections in the database and allows the users to see details develop over time. GBMS organizes the barrels and weapon systems into groups and hierarchies that can be changed and defined by the Administrator user. For each weapon system you can register shots, ammo used, in order for the officers to keep track of the usage of the weapon and the time to next inspection according to the limits recommended by the producer and the authorities. It is also possible to register other useful information like hit rate and temperature influencing the wear and tear for the barrel.

Unit	Barrel type	Ea	Status	Reason
Brigade 1	30mm barrel	149	Approved	
Brigade 1	30mm barrel	15	Approved w/comment	
Brigade 1	30mm barrel	12	Not evaluated	
Brigade 1	120mm smooth bore	35	Approved	
Brigade 1	120mm smooth bore	9	Not evaluated	
Brigade 2	155mm barrel	56	Approved	
Brigade 2	155mm barrel	36	Not evaluated	
Brigade 2	155mm barrel	8	Shooting prohibition	Safety
Brigade 3	155mm barrel	79	Approved	
Brigade 3	155mm barrel	19	Not evaluated	
Brigade 3	155mm barrel	2	Shooting prohibition	Safety

Status	Ea	%
Approved	319	76
Approved w/comment	15	3,5
Not evaluated	76	18
Shooting prohibition	10	2,4

Operational status  
Fleet management



## Benefits

Every gun barrel measurement tool generates a lot of measurement data. To be able to save measurement data and analyze the information, the GBMS database is vital.

In an informative and well-arranged way GBMS makes measurement data from the Robinca system or other measurement tools available. It combines the measurement data with Defence organization data and material to support the service organisation of the Armed Forces and weapon experts in their assessment and evaluation of the quality and condition of the individual tubes or of the total fleet.

The GBMS contributes to optimal management and service efficiency, provides an overview of the status of the Armed Forces material, budgeting, preservation and distribution of competence and experience across the Armed Forces organizations.

GBMS imports the data from the inspection and provides functionality to read, analyse and enrich the inspections with more data and comments.

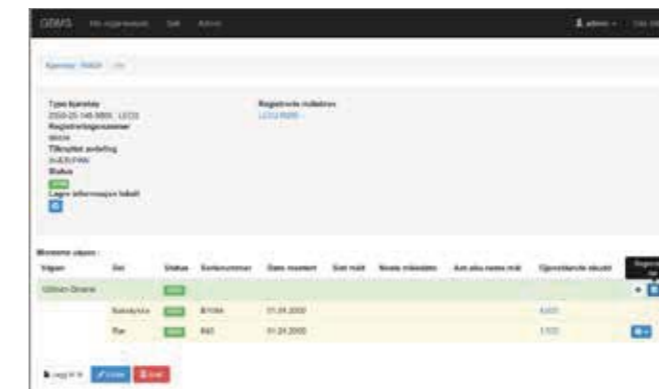
Functionality to compare inspections over time for the same barrel – including pictures – and compare inspections from different barrels.

GBMS stores all the inspections in the database and allows the users to see details develop over time.

GBMS organises the barrels and weapon systems into groups and hierarchies that can be changed and defined by the Administrator user.

For each weapon system you can register shots, ammo used, in order for the officers to keep track of the usage of the weapon and the time to next inspection according to the limits recommended by the producer and the authorities.

It is possible to register other useful information like hit rate and temperature influencing the wear and tear for the barrel.



ENHANCE SAFETY &  
OPERATIONAL AVAILABILITY

CONDITION MONITORING

SUPPORT FOR PURCHASE &  
NEGOTIATIONS

OPTIMIZE HIT PROBABILITY

FOLLOW-UP CONTRACTS,  
GUARANTEES & PROCEDURES



Foto: Arne Flaaten

## SALES OFFICES

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### **Dacon AS**

Durudveien 35  
1344 Haslum  
Norway

Phone: +47 21 06 35 11  
E-mail: [knut.glorvigen@dacon.no](mailto:knut.glorvigen@dacon.no)  
Site: [www.dacon.no](http://www.dacon.no)

Contact: Knut Glorvigen, Sales Manager

### **Everest Polska Sp. z o.o.**

Geodetów 176  
05-500 Piaseczno k. Warszawy  
Poland

Phone: +48 608 444 685  
E-mail: [pawel.stasiak@everestvit.pl](mailto:pawel.stasiak@everestvit.pl)  
Site: [www.everestvit.pl](http://www.everestvit.pl)

Contact: Paweł Stasiak, Sales Engineer