For asphalt construction and earth work
HAMM COMPACTION QUALITY
The HCQ modules form a comprehensive solution for the measurement and documentation of compaction. They function on all HAMM rollers.

Everything under control

Higher quality thanks to HCQ

HCQ stands for “HAMM Compaction Quality”. It bundles together all the HAMM solutions for compaction measurement and documentation. The modular system offers suitable components for all roller types as well as for the most diverse applications and is available for all current tandem rollers, compactors and pneumatic tyre roller. The various HCQ modules contribute to greater transparency in the compaction process with a corresponding increase in quality.
HCQ
A system for all rollers

The HCQ modules are available for all rollers that satisfy the Tier 3 or higher exhaust emission standards.

**ASPHALT**

In asphalt compaction, the aim is to minimise the void content in the asphalt. In order to be able to compact the asphalt, it must have a material-dependent minimum temperature.

Various HCQ modules are available to monitor the asphalt compaction. To measure and display the rigidity or the temperature at the asphalt surface, the HAMM Compaction Meter (HCM) or the HAMM Temperature Meter (HTM), respectively, can be used. The HCQ Navigator opens up even more possibilities: for example, it displays the number of passes and the asphalt temperature on a monitor in the roller while compacting.

**EARTH WORK**

The aim in earth work is to give the ground a specific load bearing capacity, doing so as evenly as possible over the entire area.

Two HCQ modules are available to monitor the load bearing capacity during compaction: the HAMM Compaction Meter (HCM) for measurement and display of the load bearing capacity of the soil, and the HCQ Navigator. The latter goes one step further and displays the progress of compaction and additional parameters on a screen in the roller while compacting.

**Optimising compaction processes**

How stable is the ground? How many passes have already been made over the asphalt? And how much has the asphalt already cooled down? If roller drivers have this information to hand, they can respond accordingly and compact to a high level of quality. By nature it is in particular in asphalt compaction only possible to influence the quality during the process. With the two HCQ basic modules, drivers have the proper overview with which to identify trends and increase quality.

Using the HCQ modules means an increase in compaction quality.

The HAMM Compaction Meter (HCM) allows the increase in rigidity to be read off. This enables weak points to be identified already during compaction. If the HCM is calibrated before starting to compact, it is even possible to determine the actual load bearing capacity in earth work, that is to say the degree of compaction. This optimises the number of passes and avoids over and under-compaction.

The HAMM Temperature Meter shows the current asphalt surface temperature. It enables the roller driver to decide where and how the asphalt needs to be compacted, thus making optimum use of the working time window and avoiding damage.

Applications
The modular design of the HCQ programme enables gradual equipping of every roller fleet with the different components.

**HCQ modules**

**HCQ Navigator**

The HCQ Navigator is a satellite-based system for the collection and display of all essential compaction parameters and the compaction progress of one or several rollers. This system can be employed for both earth work and asphalt compaction.

During compaction, the HCQ Navigator produces a real-time compaction map of the area worked. This map is displayed on a panel PC in the cabin. Drivers can thus see at a glance the areas which have already been adequately compacted and those which require further compaction. This depiction enables them to compact very efficiently and uniformly.

The HCQ Navigator determines the roller’s position with the aid of the HCQ satellite receiver. At the same time, a variety of data relating to the compaction process is measured. The HCQ Navigator combines the measurement values with the positional data and uses this information to generate various views, such as the number of passes or the surface temperature.

All data is stored on the panel PC and made available for analysis and documentation.

The system is extremely flexible because the panel PC, and also the HCQ satellite receiver, can be exchanged between the HAMM rollers and the construction sites.

**HCM sensor measures the vertical acceleration of the drum. A processor then determines the HMV value from these measurement signals.**

**The rollers can be equipped with one or two asphalt temperature sensors, depending on the machine type.**

**The HAMM Compaction Meter (HCM) serves to measure and display the subsoil rigidity during compaction. In order to do so, the rigidity is determined by means of a sensor on the drum during dynamic compaction.**

The measurement result is displayed on the dashboard as an HMV value. This value provides information on the current level of compaction achieved. The driver can ascertain from this whether the ground requires further compaction or whether there is a weak point. This optimises the number of passes and avoids over-compaction.

The HAMM Compaction Meter can be used on all rollers that compact dynamically using vibration.

**The HAMM Temperature Meter (HTM) is used solely for asphalt compaction. It serves to measure and display the asphalt surface temperature.**

Here, an infrared temperature sensor measures the asphalt surface temperature. It is displayed on the dashboard. This enables the driver to decide whether and how (statically or dynamically) the asphalt can be compacted. Damage such as “displacement” of the asphalt due to compaction at too high a temperature or destruction of the asphalt matrix through vibration compaction at too low a temperature is thus avoided.

The HAMM Temperature Meter can be used on all tandem and pneumatic tyre rollers.

**Measuring the compaction**

The HAMM Compaction Meter (HCM) serves to measure and display the subsoil rigidity during compaction. In order to do so, the rigidity is determined by means of a sensor on the drum during dynamic compaction.

The measurement result is displayed on the dashboard as an HMV value. This value provides information on the current level of compaction achieved. The driver can ascertain from this whether the ground requires further compaction or whether there is a weak point. This optimises the number of passes and avoids over-compaction.

The HAMM Compaction Meter can be used on all rollers that compact dynamically using vibration.

**Measuring the temperature**

The HAMM Temperature Meter (HTM) is used solely for asphalt compaction. It serves to measure and display the asphalt surface temperature. Here, an infrared temperature sensor measures the asphalt surface temperature. It is displayed on the dashboard. This enables the driver to decide whether and how (statically or dynamically) the asphalt can be compacted. Damage such as “displacement” of the asphalt due to compaction at too high a temperature or destruction of the asphalt matrix through vibration compaction at too low a temperature is thus avoided.

The HAMM Temperature Meter can be used on all tandem and pneumatic tyre rollers.
HAMM COMPACTION METER (HCM)
With the HMV value, the HAMM Compaction Meter provides information on the change in compaction during the compaction process.

HAMM TEMPERATURE METER (HTM)
The HAMM Temperature Meter determines the asphalt surface temperature in °C or °F and displays it on the dashboard.

PRE-INSTALLATION FOR THE HCQ NAVIGATOR
Pre-installation for use of the HCQ Navigator with electrical and electronic components within the roller plus a docking station for the panel PC. Earth work and asphalt rollers with cabin or protective roof can be fitted out accordingly at the factory. Retrofitting is also possible for many existing machines. With the HCQ Navigator fittings installed, the system can be mounted and started in no time at all.

HCQ NAVIGATOR
Measurement and documentation system for asphalt construction and earth work. Real-time depiction of the number of passes, rigidity, temperature, machine position and many other parameters. Simple operation through clear dialogues and symbols.

Available in three variants:
- HCQ Navigator Asphalt for asphalt compaction,
- HCQ Navigator Earth Work for soil compaction and
- HCQ Navigator Premium for use in asphalt construction and earth work.

Automatic machine detection. No parameterisation necessary. Data back-up via USB port as standard. Use of this data without further processing as documentation for continuous dynamic compaction control. Additional evaluations and statistics possible.

May be complemented with WITOS HCQ for especially user-friendly and fast data transfer from and to the machine and real-time tracking of the compaction process (Live-view).

HCQ SATELLITE RECEIVER
Receiver for the purpose of determining the exact position of the roller during the compaction process. Fitted to the roof of the roller. Reception of satellite signals and DGNSS correction signals (GNSS = GPS and GLONASS).

Receiver remains active for up to 16 hours after switching off the machine, in order to retain the last recorded position. This eliminates waiting times for system initialisation when starting work, after a break or at the start of a shift. When compacting under bridges or in radio shadows, sensors and intelligent software in the machine extrapolate for inadequate positional signals for up to a minute.

Licences for correction signals
Licences available for the reception of correction signals in various accuracy classes for different regions.

PANEL PC WITH TOUCHSCREEN
The heart of the HCQ Navigator, an extremely robust panel PC with touchscreen and USB port. Includes HCQ Navigator software. Serves as a computer, monitor, operating unit and storage medium. PC based on military standards, with powerful replaceable rechargeable battery and sealed all-metal housing, resistant to water and impacts (IP 67 = dust and splashproof), operating range from -40 to +70°C.

WLAN
Linking of data from several rollers via WLAN (Wireless Local Area Network) with continuous exchange of measurement results. Each roller driver sees the progress of work by the machine group, such as the total number of passes for all rollers.

HCQ NAVIGATOR CASE
Robust rigid plastic case for the mobile system components. Quick and secure stowage for the valuable devices. Includes charger, international adapter set, USB stick and all necessary documentation. Supplied with office software for data archiving and analysis on the office PC.

WITOS HCQ
Online connection of the HCQ Navigator for fast, secure data transfer (data back-up from the panel PC, provision of planning data); enables process data to be made available worldwide and monitored live during compaction. Wireless data communication from the roller to the WITOS portal of the WIRTGEN GROUP on a server in Germany.

DATA PREPARATION FOR VETA
Real-time data export for the US analysis software VETA.

ADAPTER KITS FOR SATELLITE RECEIVERS
Set of adapter kits for the connection of different satellite receivers to the HCQ Navigator.
The HCQ Navigator is easy to operate - be it while compacting or when archiving and evaluating.

Complex task – easy operation

The easy operation of the HCQ Navigator is just what you would expect from HAMM: with a touchscreen and large buttons, it is very clearly arranged, a feature much appreciated by roller drivers. All compaction functions are depicted on a toolbar as self-evident icons. Complicated clicking and picking is a thing of the past.

For orientation purposes, additional geolines or graphics for a particular project can be stored in the system.

Successful teamwork

When a number of rollers work in a group, the HCQ Navigator has even more benefits to offer: data from all rollers is exchanged among them via the WLAN. This enables each driver to see the compaction progress of the entire team on his monitor. The construction management is also able to view this data within the range of the WLAN and is therefore well informed of the construction progress at all times.

Additional functions included

An additional menu bar can be activated on the panel PC and in the office software for project preparation and follow-up. Here, too, the operation is kept simple: the most important functions are controlled with a single click. This enables additional information on the project or machine to be displayed, and there are various options for data back-up and analysis.

Printouts for documentation purposes

Many clients demand printouts as evidence of compliance with specifications, the load bearing capacity achieved or the results of continuous compaction control. These printouts can be quickly and easily produced with the HCQ Navigator software – without time-consuming data preparation.

Uncomplicated archiving and data back-up

During the compaction process, the HCQ Navigator records a great deal of data, such as the position, HMV value, number of passes, asphalt surface temperature, driving speed, compaction frequency and amplitude as well as machine-related data.

This data is stored on the panel PC while compacting. At the end of the work, it can be copied via USB stick to other media. It can then be archived conveniently with the HCQ Navigator software, which also runs on office PCs.
Analysing processes

The HCQ Navigator software offers many options for evaluating the data on the panel PC and on office PCs. For example, various filters enable the depiction of specific compaction types, such as when and where the rollers used static or dynamic compaction.

One highlight is the analysis of individual points or areas. Here, the compaction history with the number of passes, the compaction achieved and the temperature at the time of compaction can be displayed for each location, even years later. A particularly interesting feature in this connection is the replay function. It shows the compaction process in fast-forward. With this previously hidden view of the compaction, HAMM is opening up many possibilities with which to analyse processes and to optimise rolling patterns, for example.

Identifying weak points

Evaluations with the HCQ Navigator can also identify weaknesses in the roadbed that are invisible to the eye. During proof rolling, the roller is driven over the prepared roadbed before beginning the asphalt work, and the pass is recorded with the HCQ Navigator. An evaluation of the data will then reveal the existence of any weak points in the roadbed in question. This simple detection of inadequately compacted areas can prevent expensive damage that generally only becomes apparent years later.

WITOS HCQ: Compaction data available worldwide in real time

WITOS HCQ complements the functionality of the HCQ Navigator because it makes the process data available over the Internet in real time, already during compaction. The data is transferred by wireless from the panel PC to the WITOS portal of the WIRTGEN GROUP. There, authorised persons can see and download the data stored in the cloud. This data is available in real time, enabling even remote construction sites to be monitored.

Follow construction progress live

The absolute highlight of WITOS HCQ is the live view function. It enables live monitoring of the current compaction status for the entire construction site, thus closely following the project.

The benefits at a glance

… for roller drivers
- Ease of operation
- Quick installation
- No retraining required thanks to identical components for compactors, tandem rollers and pneumatic tyre rollers
- Data exchange between a number of machines creates transparency
- Simple and secure data archiving

… for construction companies
- Modular system with machine-independent components
- Globally deployable
- Integral overview of the entire construction site
- Higher quality thanks to improvement of internal processes
- Cost reduction due to avoidance of claims and complaints
- Easy verification of area-wide continuous compaction control
- Simple and secure data archiving

… for clients
- Comprehensive, homogenous compaction
- High compaction quality
- Clear, comprehensive compaction documentation
- Analyses can be carried out even years later

Benefits at a glance
- Ease of operation
- Quick installation
- No retraining required thanks to identical components for compactors, tandem rollers and pneumatic tyre rollers
- Data exchange between a number of machines creates transparency
- Simple and secure data archiving
- Modular system with machine-independent components
- Globally deployable
- Integral overview of the entire construction site
- Higher quality thanks to improvement of internal processes
- Cost reduction due to avoidance of claims and complaints
- Easy verification of area-wide continuous compaction control
- Simple and secure data archiving
- Comprehensive, homogenous compaction
- High compaction quality
- Clear, comprehensive compaction documentation
- Analyses can be carried out even years later