



For asphalt construction and earth work
HAMM COMPACTION QUALITY





The HCO modules form a comprehensive solution for the measurement and documentation of compaction.

Everything under control

Higher quality thanks to HCO

HCO 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 rollers. The various HCO modules contribute to greater transparency in the compaction process with a corresponding increase in quality.





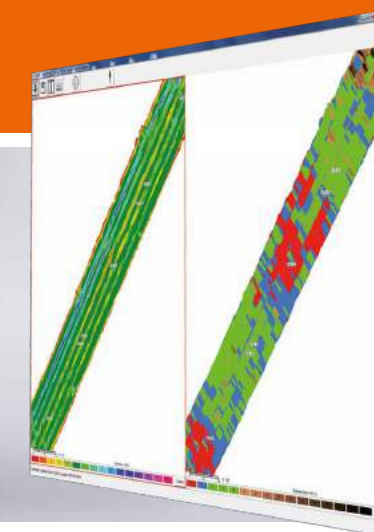
HCQ

A system for all rollers

The HCQ modules are available for all rollers that comply with Tier 3 and higher exhaust emission standards.



Using the HCQ modules means an increase in compaction quality.



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.

ASPHALT

In asphalt compaction, the aim is to minimise the voids content in the asphalt - while making sure that the desired degree of compaction is achieved. In order to be able to compact the asphalt, it must have a material-dependent minimum temperature.

HAMM offers various HCQ modules to monitor the asphalt compaction. The HAMM Compaction Meter (HCM) measures and displays the rigidity, while the HAMM Temperature Meter (HTM) measures the temperature at the asphalt surface. The HCQ Navigator opens up even more possibilities: for example, it displays the number of passes, the rigidity and the asphalt temperature on a monitor in the roller in real time while compacting.

Optimising compaction processes

How stable is the ground? Are there any weaknesses? 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. It is, of course, only possible to influence the asphalt compaction quality during the process. With the two HCQ basic modules, drivers have the proper overview with which to identify trends and increase 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.



Series H CompactLine



Series H



Series 3000



Series HP



Series HD CompactLine



Series DV+



Series HD+



Series HD



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

The HCQ modules



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



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



HAMM Compaction Meter 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 thus ascertain, for example, 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 is available for all rollers with vibration. In the VIO compactors, the HAMM Compaction Meter can additionally monitor the oscillation compaction.



HAMM Temperature Meter Measuring the temperature

The HAMM Temperature Meter (HTM) is used solely for asphalt compaction. It serves to measure and display the asphalt surface temperature. On every roller, two infrared temperature sensors measure the asphalt surface temperature. The asphalt temperature ahead of the front drum (in the direction of travel) is then displayed on the dashboard. This information helps roller drivers to decide whether to compact the asphalt and if so, how (statically or dynamically). "Sliding" of the asphalt due to compaction at too high a temperature or destruction of the asphalt matrix through vibration compaction at too low an asphalt temperature is thus avoided. The HAMM Temperature Meter can be used on all tandem and pneumatic tyre rollers.



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.

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.

A "compaction map" of the area worked is thus created in real time during the compaction process. 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.

All data is stored on the panel PC and made available for analysis, continuous compaction control (CCC) and documentation.

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



1 **HAMM COMPACTION METER (HCM)**
With the HMV value, the HAMM Compaction Meter provides information on the change in compaction during the compaction process.

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

3 **FITTINGS FOR THE HCQ NAVIGATOR**
Fittings 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 in a cost-effective manner. 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.

4 **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 compaction control (CCC). Additional evaluations and statistics possible.

The HCQ modules at a glance



HAMM

HCQ

5 **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 DGNS 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.

6 **LICENCES FOR CORRECTION SIGNALS**
Licences available for the reception of correction signals in various accuracy classes for different regions.

7 **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.

8 **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.

9 **HCQ NAVIGATOR CASE**
Robust rigid plastic case for the mobile system components. Quick and secure storage for the valuable devices. Includes charger, international adapter set and USB stick for data storage. Supplied with office software for data archiving and analysis on office PCs.

10 **WITOS HCQ**
Online connection of the HCQ Navigator for fast, secure data transfer; enables process data to be made available worldwide and monitored in real time during compaction (live view). Wireless data communication from the roller to the WITOS portal of the WIRTGEN GROUP.

11 **DATA PREPARATION FOR VETA**
Data export for the US analysis software VETA.

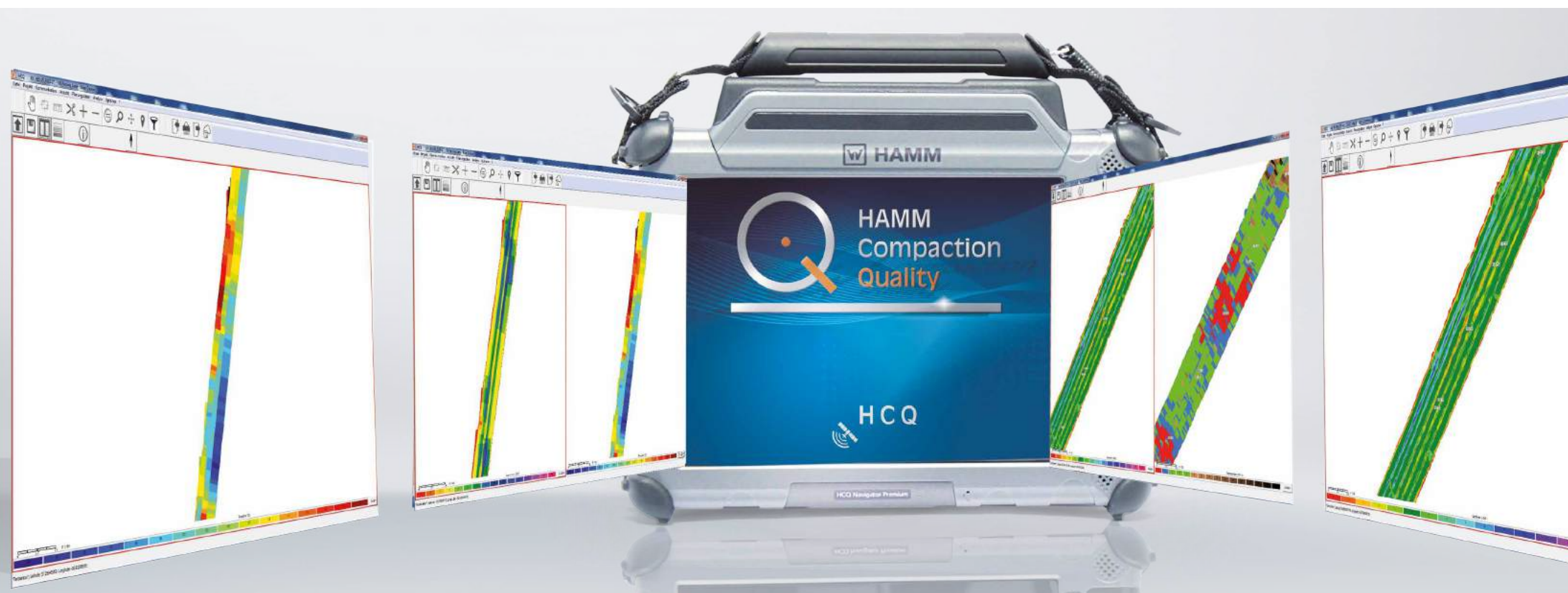
12 **ADAPTER KIT FOR SATELLITE RECEIVERS**
Adapter kit for the connection of different satellite receivers to the HCQ Navigator.

13 **PROCESS DATA GATEWAY**
Data interface on the roller for continuous transmission of HCQ sensor and machine data to external CCC systems.





HCQ Navigator Simply see more



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. The maps are displayed extra-large.

They visualise the results of the compaction measurement so that operators can take in the current situation at a glance. At the same time, the monitor can also be operated in split-screen mode. In this case, the panel PC displays different graphics simultaneously in two separate windows, for example the number of passes completed and the current asphalt surface temperature. 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. Using WITOS HCQ (see page 15), the construction management is also able to view this data and is therefore well informed on 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.

Print-outs for documentation purposes

Many clients demand print-outs as evidence of compliance with specifications, the load bearing capacity achieved or the results of continuous compaction control (CCC). These print-outs 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, HVM 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.



HCQ Navigator Comprehensive analyses

WITOS HCQ

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 continuous compaction control (CCC)
- ▶ 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



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, a 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 view the data stored in the cloud and download it with the VETA export process.

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 - from the office or any other place with Internet access.

HAMM AG
Hammstraße 1
D-95643 Tirschenreuth
Tel +49 9631/ 80-0
Fax +49 9631/ 80-111
www.hamm.eu



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