FROM: Julian Renz – Product Specialist

SUBJECT: HR 550 FS and HRA 551 FS Wireless Handwheel System

DATE: October 24, 2017

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The launch date for the revised HR 550 FS and HRA 551 FS will be November 1, 2017. The Product Information will therefore be released November 1, 2017.

The HEIDENHAIN HR 550 FS and HRA 551 FS wireless handwheel system was brought to market in 2011 and has since proven itself, especially among customers owning large machines with walk-in work rooms.

The HR 550 FS and the HRA 551 FS use the ISM radio band in the frequency range of 2.405 GHz to 2.480 GHz, which is largely accessible worldwide. To improve the coexistence of radio components in this frequency band, the band has been revised based on the applicable ETSI EN 300 328 standard (currently valid version: V2.1.1). This involved an adaptation of the mechanical interplay between the two components in addition to an adaptation of the power spectral density in accordance with the requirements of the standard.

Previously units sold may, of course, still be operated due to grandfathering rights.

Product description

As part of the necessary revision of the HR 550 FS and the HRA 551 FS, the following additional modifications were made to the wireless handwheel system:

1. To counteract the reduced transmission power, the antenna technology used in the HR 550 FS and the HRA 551 FS was reworked. Nearly the same wireless range values could be achieved by this means. Better values are sometimes achieved with the old wireless handwheel system and sometimes with the new, depending on the environment.

2. The holder between the HR 550 FS and the HRA 551 FS has been reworked and improved for better user friendliness, among other things. The handwheel must no longer be pushed into the handwheel adapter from above, as was previously the case, but can now be simply placed onto it. The positioning and attachment of the HR 550 FS onto the HRA 551 FS is achieved with integrated into the HR 550 FS magnets. See the dimension drawings in the Attachments.
3. For the new HR 550 FS, a nickel-metal hydride battery (NiMH) with slightly increased capacity (previously 2.4 Ah, now 2.6 Ah) is now used. The battery is compatible with the previous version and can be used in the previous HR 550 FS. Ideally, the new battery should also be used with the new HR 550 FS.

The other features and characteristics of the HR 550 FS and the accompanying HRA 551 FS handwheel adapter have remained unchanged.
Comparison of variants

<table>
<thead>
<tr>
<th>Previous</th>
<th>New</th>
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</thead>
<tbody>
<tr>
<td>HR 550 FS wireless handwheel (without detent)</td>
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</tr>
<tr>
<td>ID 598515-03</td>
<td>ID 1200495-01</td>
</tr>
<tr>
<td>HR 550 FS wireless handwheel (with detent)</td>
<td>HR 550 FS wireless handwheel (with detent)</td>
</tr>
<tr>
<td>ID 606622-03</td>
<td>ID 1183021-01</td>
</tr>
<tr>
<td>HRA 551 FS handwheel docking station for HR 550 FS</td>
<td>HRA 551 FS handwheel docking station for HR 550 FS</td>
</tr>
<tr>
<td>ID 731928-02</td>
<td>ID 1119052-03</td>
</tr>
<tr>
<td>Replacement battery for the HR 550 FS</td>
<td>Replacement battery for the HR 550 FS</td>
</tr>
<tr>
<td>ID 623166-02</td>
<td>ID 623166-03</td>
</tr>
</tbody>
</table>

Compatible with previous version.
User Benefits

Thanks to the new revision, the HR 550 FS and the HRA 551 FS comply with the newest radio standards. The attachment between the handwheel and the handwheel adapter features greater user friendliness and a high level of sturdiness for continuous operation. The general advantages resulting from a wireless system make the HR 550 FS of particular interest for use in large machines in which the machine operator can check and control the machining process in the working space. Wireless operation is not only more convenience but also safer. With the wireless handwheel system, HEIDENHAIN provides the machine operator with unlimited freedom of motion. Tripping hazards and the risk of snagging as a result of the handwheel cable are now things of the past.

Schedule

The new wireless handwheel system, consisting of the HR 550 FS and the HRA 551 FS will be available for order as of November 1, 2017.

Documentation

- The next edition of the technical manual for your respective control
- The next edition of the HR 550 FS (ID 636227-xx) product information document — (valid as of November 1, 2017)
- Dimension drawings in the Attachments.

Procedure should servicing become necessary

- The new variants of the HR 550 FS can only be operated with the new variant of the HRA 551 FS, i.e., only the complete wireless handwheel system can be exchanged!
- An update of the control software is not necessary.
- The parameterization of the wireless handwheel on the control remains the same.
- The dimensions and connections of the new HRA 551 FS are compatible with the previous variants.
- The optionally available “mount for HR 520 (FS), HR 550 FS” (ID 591065-02) can no longer be used for the new HR 550 FS. The reason for this is the radically reworked holder between the HR 550 FS and the HRA 551 FS (see item 2 under “Product description”). A successor product is not planned.
- The previous wireless handwheel systems will be repaired by the HEIDENHAIN Customer Service Department until further notice.
- After discontinuation, the current wireless handwheel system will no longer be available—even from the HEIDENHAIN Customer Service Department—because the applicable standard (see introduction) will no longer be met! Grandfathering rights apply only to those units that were brought to market before the discontinuation takes effect.
Discontinuation of the previous HR 550 FS variants and of the accompanying HRA 551 FS

Due to the new EN 300 328 V2.1.1 standard, the current components will not be discontinued over the course of a normal transition period but rather immediately as of December 31, 2017. The following ID numbers are affected by this discontinuation:

<table>
<thead>
<tr>
<th>Components</th>
<th>IDS</th>
</tr>
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<tbody>
<tr>
<td>HR 550 FS wireless handwheel (without detent)</td>
<td>598515-03</td>
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<td>HRA 551 FS handwheel docking station for HR 550 FS</td>
<td>731928-02</td>
</tr>
<tr>
<td>Replacement battery for the HR 550 FS</td>
<td>623166-02</td>
</tr>
</tbody>
</table>

Furthermore, the previous versions of the HR 550 FS and the HRA 551 FS are not interchangeable with the new units. As mentioned previously, an update of the control software is not necessary. In addition, the dimensions, including the mounting holes and the connections of the new HRA 551 FS will remain the same as those of the previous variants. Please take special note of the information provided under the section “Procedure should servicing become necessary.”

Attachments

- Checking the radio environment at the intended place of use
- Dimensions
Checking the radio environment at the intended place of use

The following procedure continues to be very important in determining whether a wireless handwheel system can be used in a certain radio environment:

- Clarification as to whether the HEIDENHAIN wireless handwheel system is allowed to use the 2.4 GHz ISM band in the customer’s location (country-specific and company-internal regulations at the intended place of use and the end user’s site must be taken into account).
- Inquiry about known radio participants at the end user’s site. Ideally, the end user can provide information regarding the utilization of the 2.4 GHz ISM band at the intended place of use by the wireless handwheel.
- If it cannot be clearly ascertained with the customer which devices are using the 2.4 GHz ISM band at the intended place of use, we recommend conducting tests with a suitable spectrum analyzer and a Wi-Fi detection device.
  HEIDENHAIN recommends performing the measurements using a so-called "Wi-Spy USB 2.4x Spectrum Analyzer" to obtain a usage profile of the 2.4 GHz ISM band. This low-cost USB device for PCs, in combination with the accompanying “Chanalyzer 4” software, makes it possible to adequately visualize the radio activity in the frequency spectrum and to identify other Wi-Fi networks that could interfere with the connection.

Figure: Spectrum Analyzer image of a radio environment

- Selection and determination of an available radio channel for the wireless handwheel system

If no vacant radio channel can be found despite the above-mentioned measures, we advise against using the wireless handwheel system.
Dimensions

HR 550 FS handwheel

HR 551 FS handwheel adapter
Product Information

**HR 550 FS**
Electronic Handwheel with Wireless Transmission
User-friendly setup with HEIDENHAIN handwheels

Delicate manual traverse
For setup, you can use the axis-direction keys of the machine operating panel to move the machine axes manually or in incremental jog. A simpler and more reliable way, however, is to use the electronic handwheels from HEIDENHAIN. With the portable handwheels you are always close to the action, enjoy a close-up view of the setup process, and can control the infeed responsively and precisely.

The HR 550FS with wireless transmission is exceedingly simple to use: since it communicates with the handwheel holder via radio transmission, your movements are not restricted in any manner, and you can fully concentrate on the action in the machine’s working space. The practical HRA 551FS handwheel holder is not just a docking station for the handwheel: it also features an integrated charger for the handwheel’s battery, so that your HR 550FS is always ready for the next job.

The transmission range is amply dimensioned. If you should nevertheless happen to come near the edge of the transmission area, which is possible with very large machines, the HR 550FS warns you in time with a plainly noticeable vibration alarm.

When the handwheel is in the docking station, contacts on its back ensure uninterrupted operation in the event of unexpected disturbances in the radio field.

System requirements
The HR 550FS can be connected to the following controls:

- TNC 640
- TNC 620
- TNC 320
- TNC 128
- iTNC 530
- CNC PILOT 640
- MANUALplus 620

As of NC software

- TNC 640: 34059x-02
- TNC 620: 81760x-01
- TNC 320: 771851-01
- TNC 128: 771841-05
- iTNC 530: 60642x-01
- CNC PILOT 640: 68894x-05
- MANUALplus 620: 548431-06

The connecting and adapter cables are identical with those of the HR 420 and HR 520.

The HR 550FS electronic handwheels from HEIDENHAIN are available with and without mechanical detent, with 100 stops per revolution. The traverse path per step can be set via parameters. It also features numerous valuable additional functions:

The handwheel display consists of a header and six status lines. It displays important machine conditions and information (e.g. position of the selected axis, spindle speed, feed rate, error messages, active basic rotation and tilted working plane) as well as the functions of the five soft keys, which the machine manufacturer can assign as desired. The header provides information on the active radio operation, field strength and the battery’s state of charge.

The colored and raised axis keys permit traverse of up to six NC axes. In addition, the machine manufacturer can configure an axis key for selection of the so-called “virtual tool axis.”

In addition to the soft keys, the machine manufacturer can assign special functions to six function keys. They can be illuminated by LEDs. The symbols for the axis designations and the function keys can be exchanged.

The axis feed rate, which is activated when the arrow key is pressed, and the spindle speed can each be set with an override potentiometer.

The HR 550FS handwheel also features the usual safety buttons: an emergency stop button and two permissive buttons. The safety functions of the HR 550FS fulfill the requirements of performance level d, category 3, according to EN ISO 13849-1. In addition, HR 550FS fulfills the requirements of EN 60950.
<table>
<thead>
<tr>
<th><strong>Design</strong></th>
<th>Handwheel with wireless transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional safety</strong></td>
<td>For applications up to category 3, PL d according to EN ISO 13849-1: 2015</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>Monochrome 6-line display (128 x 64 pixels)</td>
</tr>
</tbody>
</table>
| **Handwheel***  | HR 550FS without mechanical detent: ID 1200495-xx  
HR 550FS with mechanical detent: ID 1183021-xx |
| **Operating elements** | 6 keys for axis selection (symbols can be exchanged)  
6 keys with permanent NC functions  
6 keys with LEDs for free assignment via the PLC (symbols can be exchanged)  
2 override potentiometers for feed rate and spindle speed  
5 soft keys for menu-guided operation |
| **Safety buttons** | Emergency stop button (dual-channel)  
2 permissive buttons (dual-channel) |
| **Handwheel holder** | HRA 551 FS: ID 1119052-xx  
For docking the HR 550FS on the machine  
Integrated battery charger for HR 550FS  
Connections to the control and the machine  
Integrated transmitter/receiver unit |
| **Radio transmission** | According to EN 300328 V2.1.1; EN 301489-1; EN 301489-17;  
FCC ID HR 550FS: YJKHR0GACZ4; FCC ID HRA 551 FS: YJKHRAGACZ4 |
| **Radio link**  | 16 channels (ISM; 2.4 GHz)  
Transmission range up to 20 m (depending on environment)  
Radio power of 11 dBm (EIRP) |
| **Functions**   | Display of field strength  
Vibrating alarm upon leaving the transmission area  
Battery warning/battery charge indicator |
| **Voltage supply** | HR 550FS: via battery pack (included in delivery; replacement ID 623166-xx)  
HRA 551 FS: by standard connection from the control |
| **Operating time** | Continuous duty typically 6 h |
| **Charging process** | Automatic when handwheel is in the HRA docking station, duration approx. 200 min |
| **Mass**        | HR 550FS: approx. 1 kg  
HRA 551 FS: approx. 1 kg |

* Please select when ordering
Dimensions

For more information:
To ensure the correct operation of the handwheel, comply with the requirements described in the Technical Manual and User’s Manual of the respective control.

For brochures and product information sheets, visit us on the Internet at www.heidenhain.de ➤ Documentation

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