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Manual

for

Handheld Service Unit HSU 3.0

For the operation of Turntables (TT),

Turn Devices (TD)

and Antenna Masts (AM)

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2 Safety instructions, general instructions, decommissioning

2.1 Operator responsibility

- Make sure that the system is operated only by personnel who have been authorized and instructed by the operator!
- Define an area of risk, which must not be entered while operating the system!
- Affix the instructed person's signature, that the operating instructions have been read and understood!
- Ensure that a copy of the entire operating manual is permanently ready to hand at the system!
- Determine the responsibility in accordance to the different fields of duty exactly (Maintenance, upkeep, etc.)!

2.2 Danger caused by energy

2.2.1 Danger from electrical energy





The device may only be connected to a power supply, where the protective conductor has a proper grounding.
Any damage or interruption of the protective conductor inside or outside of the device, or interruptions of the protective earth terminal can result in injury.
The electrical commissioning of this device may only be performed by authorized personnel. The legal local rules and safety regulations must be adhered to.
Even when the device is turned off, there remains residual electrical energy in conduits!
Working at electrical components may only be performed by qualified electricians, before that the system must be disconnected from the mains.

2.2.2 Danger from mechanical energy

Caused by the movements of parts of the system, there is a risk of crushing as well as drawing-in hazard during operation. The defined area of risk must not be entered. While the system is stationary, there is a risk of impact as well as tripping hazard.

2.3 Residual hazards

Despite all precautions taken, there may occur unobvious residual hazards.
These can be reduced by considering the safety advises, the intended use and the operating instructions.

2.3.1 Risk of injury by malfunctions

Malfunctions or operating conditions which may affect the safety, force the shutdown of the system by separating the power supply.
Before re-commissioning of the system, proper restoring of the intended condition is required.

2.3.2 Risk of impact, tripping falling

After removal of panels or plates, as required e.g. for maintenance, there is a danger to stumble against or to trip over parts of the system, or to fall in maintenance hatches.

2.3.3 Danger of slipping

During the operation or caused by malfunctions of the system there may form contamination or leak on ground near the system.

2.3.4 Explosion hazard through flammable detergents

During the maintenance there is a risk of explosion if highly flammable detergents are used for cleaning the system.

2.3.5 Risk of injury from irritant, health-damaging or caustic substances





There are dangers when handling consumable supplies like oils, detergents, etc. While working with these, the currently valid operating and work instructions or safety data sheets for handling of the respective substances must be observed.

2.3.6 No entry for unauthorized persons


There is risk of injury if unauthorized persons enter the pre-defined are of risk of the system. The operator must ensure that unauthorized persons, as visitors, customers, etc. have no access to the risk of area of the system.

2.3.7 Risk of death by falling loads


In the defined danger zone there is risk of death caused by human error or insufficient secured loads.

During installation, repair or maintenance of the system, appropriate lifting devices must be used, and the personal protective equipment must be used.

2.3.8 Risk of injury from hot surfaces

Especially motors are heating up during operation and cause risk of burning. Before maintenance and repair it is necessary to ensure that all components are cooled down.

2.3.9 Risk of injury from use by unauthorized persons or third parties

There are risks if unauthorized persons or third parties operate the system via the control unit while personnel are staying unauthorized in the area of risk.

2.3.10 Danger from laser beams


During setup operation of the device laser systems are used. Never look into the laser beam! Wear safety glasses!

2.4 General instructions

Before carrying out any repairs, always contact maturo GmbH previously.
Independent repairs or modifications to the equipment may cause warranty to expire.

Before any repairs the electrical power supply must be interrupted. At many points of the individual component's voltages appear that can cause injuries when touching.

Only trained staff may carry out settings and / or repairs to the devices. At the capacitors inside the device can still be voltage even if the device is powered off.

Regularly inspect and maintenance all devices in accordance with the provided instructions
Only use spare parts that are ordered or recommended by the manufacturer.

The devices must be clean and free of dust. A dirty or dusty environment may cause electrostatic interference.

To prevent electromagnetic interference, we use filters with a high leakage.

These filters are installed in each phase and the neutral conductor. The filters are principally used in products which are grounded to the floor, for example AM, CAM, TAM, EAS, TD, WPTC, MVCF. The filters are also installed into turn tables with higher loads, starting at TT2.0-1t. In most EMC chambers no Residual Current protective device (RCD) is installed. This is legit when sockets are built for a specific item of electrical equipment. In this case, the high leakage current has no effect.
If you are planning to install an RCD in the EMC chamber, then a 30mA RCD is too small!
You must use a 300mA RCD!

Technical changes and errors expected as product enhancements are made regularly. Pictures included are for illustration only and do not represent all possible configurations.

2.5 Decommissioning

2.5.1 Switch of the system

Stop all remote controls by external software!
Move the devices to their parking positions (see instructions for the control unit)!
Turn off the respective control unit and devices with their power switches and disconnect the equipment from the power supply!

2.5.2 Storage of the system

Turn off the system, disconnect all data connections between control units and devices!
The storage area must be cool and dry to avoid corrosion on the individual devices of the system. The room temperature of the storage area must be constantly between 5°C and 25°C, the humidity must not be more than 50%.

- Prepare the individual parts of the system to avoid any external damaging influences during storage!
- If necessary, use cardboard, wooden boxes and other packaging material!
- Secure all components against accidental tilting and instability!

2.5.3 Dispose of the system

This device must be disposed according to the applicable regulations and legislation from domestic waste. By collecting and recycling of recyclable materials the natural resources are conserved, and it is ensured, that all the applicable regulations for the protection of health and the environment are considered.

3 General Instructions and Precautions

Before this device is applied with power:
Ground it properly through the protective conductor of the power cable to a power source provided with protective earth contact. Any interruption of the protective (grounding) conductor, inside or outside the device, or disconnection of the protective earth terminal could result in personal injury.

The electrical installation of this product must be accomplished by an individual who is authorized to so do by the appropriate local authority. The installation must follow local electrical safety codes.

Only qualified personnel are allowed to operate or service this equipment.

Before making service, contact maturo GmbH
Service or modifications of the device by yourself may void your warranty.
If you attempt to service the unit by yourself, disconnect all electrical power before starting. There are voltages at many points in the components which could, if contacted, cause personal injury. Only trained service personnel are allowed to perform adjustments and/or service procedures upon this device. Capacitors inside this instrument may still be charged even when instrument is disconnected from its power source.

Stay clear of moving components during the operation of the device.
Do not operate the device while somebody is close to moving parts.

The protection of the area of risk at site is part of the operator.

Read this manual completely before starting installation. This equipment must be installed and operated only by qualified personnel.

Regularly inspect all equipment and conduct scheduled maintenance in accordance with the factory recommendations provided. Only use replacement parts and fasteners ordered directly from the factory.

Information presented enclosed is subject to change as product enhancements are made regularly.
Every effort has been made to ensure that the information in this manual is accurate. However, no liability or guarantee is assumed for the up-to-dateness, correctness and completeness of the information provided herein.
Pictures included are for illustration purposes only and do not represent all possible configurations.

4 Technical data of Handheld Service Unit HSU 3.0

The Handheld Service Unit HSU3.0 is suited for the service and the commissioning of positioning devices of the controller generation 3.0.
The HSU3.0 permits simple manual operation of all positioner axes, error diagnosis, as well as changing the positioner's IP-Address.
Operating the positioner with the HSU3.0 is also possible without a connection to the control application maturo mcApp.

Figure 1: HSU 3.0

Technical data

Ports	1x LAN / RJ45, 1xUSB-A, 1x USB – B, Sub-D
Transfer Rate	9600 Bit/s
Voltage	5Vdc
Current consumption	0.5 W
Size in mm (B x T x H)	155 x 95 x 30
Temperature Range	5°C – 40°C
Total Weight	200 g
Accessories	1x D-Sub cable 2m

5 Commissioning HSU 3.0

Connection

The connection between HSU3.0 to the positioning device is made with the FOM3.0, which is installed in every positioning device of the controller generation 3.0. Use the provided 15-pin SUB-D cable and connect at connector XH1.

After usage the dust cover must be mounted again, as an open connector might disturb the EMC-performance.

Figure 2: FOM 3.0

6 Operation

6.1 Connect the HSU3.0

It is important that the positioning device is already booted up when the HSU3.0 shall be activated. The boot-up routine of a positioning device typically takes around 30 seconds.

During the boot of the HSU3.0, the serial number and the software version of the HSU3.0 are shown for a short period. The shown information is only valid for the HSU3.0, but not for the connected positioning device.

Figure 3: Boot-up

Figure 42: Boot-up finished

6.2 Buttons

There are four buttons with the following functions:

„Ok“ to enter a submenu, confirm an input value, finish an input routine, or activate a function

Figure 53: OK

„Esc“ to go back to the last menu, or cancel an input or function

Figure *64:*

„Up“ to navigate through the menus, increment input values, or move to direction maximum during Jog-Mode

Figure *75:*

„Down“ to navigate through the menus, decrement input values, or move to direction minimum during Jog-Mode

Figure *86:*

6.3 State indicators

There are four state indicators:

L/A-XF1: State of the fiber optic connection from FOM3.0 to FCU3.0.
- ➔ LED on – there is a physical connection
- ➔ LED blinking – data transmission active

L/A-XF2: State of the fiber optic connection from FOM3.0 to another positioning device (optionally)
- ➔ LED on – there is a physical connection
- ➔ LED blinking – data transmission active

Error: Error on positioning device
- ➔ LED red on – Error axis
- ➔ LED red blinking – Error bus terminal

State: State of positioning device
- ➔ LED yellow on – device is referencing
- ➔ LED green on – positioning active (moving)
- ➔ LED red blinking – active connection to mcApp

Figure 97: State indicators

6.4 Menu

After boot-up confirm the connection with “Ok”. The following information appear (example values):

Product serial number:	TAM4.0-E / 000
Project number maturo GmbH:	P-0000.01
Software revision of positioner:	Softw 3.0.2.4775

Figure 80: Start screen

If the communication between HSU3.0 and the positioner cannot be established, the message “wait...” appears. This can happen if the positioner has not booted up fully yet for example. The message disappears automatically as soon as communication is established. After a timeout of around 10 seconds, the connect attempt is canceled and “To connect: Press ok” appears.

Figure 91: Timeout

By pressing „Ok“ another time, the main menu structure appears. The currently active menu is indicated by “>”. With “Up” and “Down” the active menu point can be changed. By pressing “Ok”, a submenu can be entered. With “Esc” a submenu can be exited.
Some of the described menus are eventually not available for certain positioning devices and are hidden in this case.

Figure 1210: Main menu

Figure 1311: Submenu „Lan“

6.4.1 Lan

IP-Address

At „IP-Address“ the current address is shown. By using “Ok”, “Up” and “Down” the address can be changed. Attention, after changing the last part of the address and pressing “Ok”, the device automatically boots with the new address. This can take a few seconds, depending on the positioning device.

The input can be canceled with “Esc” anytime.

Figure 1412: IP-Address

Subnet

The subnet is changed similar to the IP-Address.

Figure 1513: Subnet

6.4.2 Operate

Enable State

Every device must be enabled first. This happens at the submenu “Enable State”. It is important to set the enable via HSU to control the axes via HSU.
Press “Ok” to toggle the enable (On or off).

Figure 1614: Enable State

Reference State

Some device must also be referenced.
“Ref not ok” indicates that the referencing is needed. “Ref ok” indicates that the referencing has been completed and the device can be moved.
There are two reference possibilities:

1 → „..saved positions OK“ - Use the saved positions, if existing.
2 → „start complete REF“ - Start a referencing routine
➔ Tilt mast must be leveled to water level, when „..up/down or OK“ appears.
Use „Up“ or „Down“ to level the axis and confirm with “Ok”.

Figure 1715: Reference State

Move

At the submenu „Move“ semi-automatic positioning is possible to an input value.

The positioning is stopped if:

- ➔ The target position is reached
- ➔ „Esc“ is pressed
- ➔ The communication from HSU and positioner is interrupted, for example upon unplugging the cable

Figure 1816: Active positioning

Set Polarization

Press “Ok” to toggle the polarization from vertical to horizontal and vice-versa.

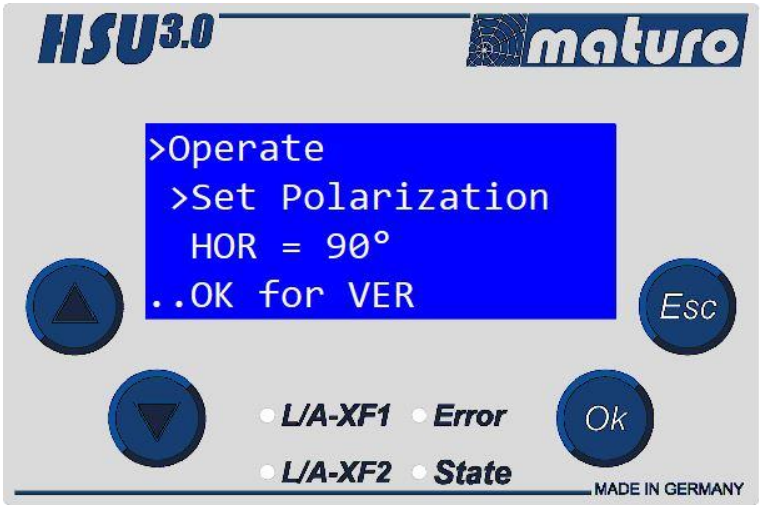

Figure 1917: Horizontal

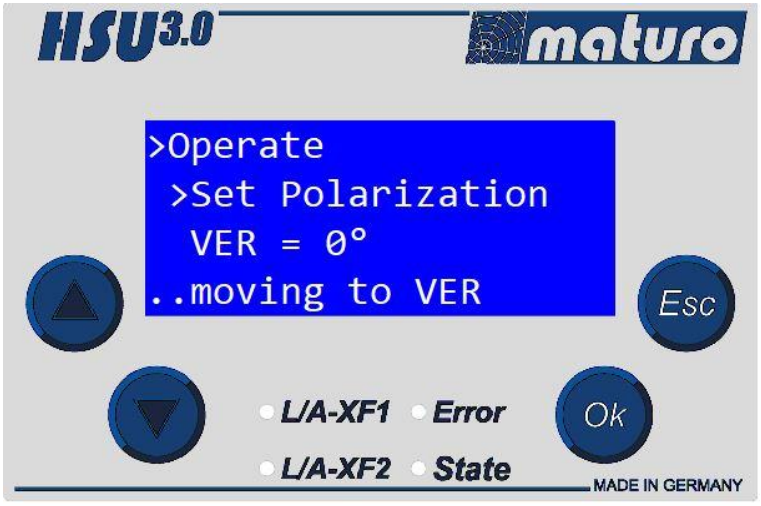

Figure 2018: Active positioning to vertical

Jog

In this menu the axis can be moved in between the limits with “Up” and “Down”. The positioning is active for as long as the button is pressed and no limit is reached. For Tilt antenna masts the actual tilt angle is also shown here.

Figure 2119: Jog

6.4.3 State

Axis

In this submenu eventual error codes are shown. Press “OK” to reset errors.
Eventual errors are also indicated by red LED “Error”.

Figure 2220: Error Axis

Positioner components

This submenu shows the state of each bus terminal and drive axes. Those devices are ready for operation in “OP” state. An error is also indicated by red blinking of LED “Error”.

Figure 2321: Terminal OP

Figure 2422: Terminal Error

Limit switch

If the positioner has referencing or limit switches, the actual state of the switches are indicated here. This also allows independent testing of the switches.

Figure 2523: Switch

mcApp

Indicates whether control application mcApp is connected

Figure 2624: McApp

6.4.4 Settings

The speed, acceleration and deceleration of each drive axis can be set here. The input values are saved even after power off.

Figure 2725: Settings

Tilt-Masts

Every tilt mast has additional settings for the tilt axis here. A detailed description of each parameter is found in the manual FCU 3.0 / FCU-S 3.0.

- ➔ Enable Tilt
  Enable or disable the tilt function. Only possible while at the lowest position.
- ➔ EUT-Height
  Height of EUT (Equipment under test)
- ➔ EUT-Distance
  Distance to EUT (Equipment under test)
- ➔ Antenna Off
  Antenna offset to antenna reference point

6.4.5 Limits

The possible minimum and maximum limits are shown here. The values cannot be changed.

Figure 2826: Limits

6.4.6 Device

In the submenu device the same information as in the start screen are shown

- ➔ Serial number
- ➔ Project number
- ➔ Software version

Figure 2927: Device

6.4.7 Restore

„Restore Factory Image“ can be used to restore to the factory settings. Therefore a code must be entered. The code is managed by maturo GmbH is only provided upon need. After input of the code and rebooting the positioner’s factory settings are restored.

Figure 3028: Restore Factory Image

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Notes