EN - Instruction Manual

Issue/Rev. 1.05 (03/25)
MN F10 001 EN ◄ ► DOK-523E

Remote Control and Overfill Prevention Amplifier

MultiControl

GUIDANT

Further documentation on this product:

Description	Order no.
MultiControl EN - Quick Guide	MNF10002EN / DOK-549E
MultiControl Battery change (MC3(W)ASE)	SVF10001EN / DOK-544E
MultiControl Battery change (MC3(W)HH)	SVF10002EN / DOK-550E

Documentation on the Internet:

kb.guidantmeasurement.com/Content/Topics/KB/Measurement-Tech-Content/SH/Sening-Launch.htm

History

Revision	Date	Editor	Status	Description
Rev. 1.00	April 2011	RA / RL / jp	preliminary	- Basic edition
Rev. 1.02	November 2011	RL / jp	release	- Editorial changes
Rev. 1.03	April 2012	RA / RL / jp	release	- Editorial changes - New Basisstation (MC2BASE2)
Rev. 1.04	February 2013	RA / RL / jp	release	- New ASE (MC2ASE2) - New HH (MC2HH2) - Battery change (MC2ASE2) - Battery change (MC2HH2)
Rev. 1.05	March 2025	RL	release	- Updated to MC3 & MC3W

Table of Contents (English)

1 General

1.1 Orientation aids for the manual

We have provided some orientation aids so that you can easily find the necessary information in this manual.

The information in this manual ranges from imperative safety procedures and standardized guidelines through to concrete handling procedures and advice. To differentiate these more easily, the information is marked with corresponding pictograms in front of the relevant text.

These are intended not just to draw particular attention to these passages, but also to make it easier to find the information you want. Therefore the pictograms are symbolic of the underlying textual content.

The following pictograms are used in this manual:

Danger sign
Danger of explosions caused by easily ignited gases and liquids here.

Risk of operating fault
Actions that may damage the equipment.

§ **Legal notice**
Actions that may have legal consequences.

Working step
Concrete action statements, e.g.: *“Press the <Enter> key”.*

▶ **Input necessary**
e.g. via numeric or function keys.

Positive response message
e.g. “The main menu now appears”

Negative response message
e.g. “If a fault message appears now...”

Background information
Short-Tip, e.g. “See more detailed information in chapter XX”.

Option
Special case.

Function
Functional description.

NOTE:
indicates a special situation.

ATTENTION:
particular attention is to be paid.

2 General Installation Notes

2.1 Safety instructions

Caution:
This information must be carefully read and observed before operating the unit.

2.1.1 Notes on Ex protection

All the components marked with the sign of  are explosion-proof electrical equipment and safety-tested and certified.

Caution:
Any interference, mechanical or electrical, is not permitted.

EX-protection regulations must be observed!

The MultiControl components (MC3(W)BASE, MC3(W)ASE, MC3(W)HH) are **NOT** suitable for use in hazardous areas. The OFD circuit is an intrinsically safe circuit. Via an extension cable (MC2CABLE) the OPU amplifier can be connected to an AI OFD sensor.

2.1.2 Operating elements

CAUTION:
Do not open the housing cover when the unit is connected to the voltage supply!

Work must only be carried out on the Ex-e terminals when the unit is voltage free. National regulations must be satisfied when operating this unit. When performing operational checks, observe the guidelines laid out in IEC / EN 60 079-17.

2.1.3 Disposal

Disposal of batteries

The batteries in the controller should be replaced by a skilled person. Used batteries must not be disposed of as standard domestic waste. Ensure that all used batteries are disposed of via suitable disposal facilities.

2.1.4 Proper intended use

- The remote control is used exclusively for control and monitoring of the delivery system in collaboration with MultiFlow measuring systems on tank trucks. The corresponding applicable safety regulations (e.g. Ex protection) must be complied with.
- Any form of use which exceeds the scope described above is deemed to be improper use; the F. A. Sening GmbH is not liable for damages resulting from such improper use.
- Proper use also includes compliance with the conditions set out by the F. A. Sening GmbH with regard to operation, installation and maintenance.
- The remote control must only be operated, serviced and repaired by personnel who are familiar with the equipment and who have been trained regarding the dangers involved.
- If you discover any signs of damage or breakage on any parts of the system or if the system’s safe operation cannot be guaranteed for any other reason, do not start the system or, if already in operation, shut down the system immediately. Notify your maintenance department.
- The F. A. Sening GmbH cannot be held liable for any damages arising as a result of unauthorized changes to the remote control.

2.2 Notes on installation

- In the event of a fault, the affected assembly may only be completely replaced. A battery change as well as installation of the device may only be conducted by a specialist.
- All electrical devices and junction boxes must be mounted stably and with low vibration in the driver's cab or in an electrically protected, dry housing outside the Ex room.
- During welding work on the vehicle, the supply lines from the tanker truck's on-board power supply to the respective electronic system must be disconnected.

- The electrical installation must be carried out according to VDE165.
- The MultiControl overfill prevention amplifier unit (OPU) may only be operated outside the Ex area.
- When discharging gasoline, the OPU must be connected with an extension cable and operated outside the Ex area. The sensor circuit is approved for zone 0. Only sensors in accordance with TRbF 511 may be connected.
- When discharging gasoline, the MultiControl Hand-Held remote control (HH) may only be operated outside the Ex area.
- The MultiControl's batteries may only be charged outside the Ex area. Charge the batteries at temperatures above 5 °C (41 °F).
- Interruptions in the wireless connection can arise while operating the remote control. It is therefore advisable to establish an uninterrupted line of sight between the vehicle's antenna and the Hand-Held remote control (HH) while discharging. If no wireless connection is established, it is very likely that the antenna is in a "dead zone". Often it is sufficient to change the vehicle position slightly.

2.3 General Operating License

These systems conform to the fundamental requirements and other relevant regulations of directive 199/5/EG.

The radio module operates in the frequency range of 869.400 to 869.650 MHz and conforms to the "ERC Recommendation 70-03 (Edition February 2003)".

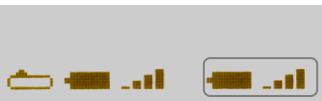
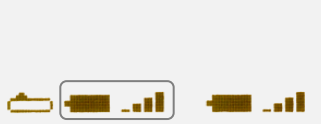
The system may be operated in all EU countries without registering, except for Bulgaria, Greece, Italy, Lithuania and the Republic of Slovakia (according to Annex 1 Band I – Non Specific Short Range Devices –).

3 Quick Start

The main keys

Abb. 1: Remote control function keys

Key	Functionality
F1	**<F1> - Setup** Settings or switch between discharge quantity and flow rate while discharging.
F2	**<F2> - Shift** function (active 2 sec.) as well as further **Setup** settings
1 Start 9 Vol. - 0	**<Numeric keys>** Change default values
1 Start	**<Start>** Discharge start **<SHIFT> + <Start>** Start Motor
3 Stop	**<Stop>** 1 x Pause the discharge **<Stop>** 2 x End the discharge **<SHIFT> + <Stop>** Shut off the motor

Key	Functionality
	**<Emergency Stop>** Stop the current discharge. The motor is disconnected.
	**<Set +>** Increase engine speed **<Set - >** Decrease engine speed Only possible during the discharge
	**<SHIFT> + <AUX>** Activates the embedded function
	Depending on the software version, the volume preset taken from MultiFlow can be changed in the "**Preset menu**" or with the keys **<Vol+> and <Vol->** in 100l steps and with **<SHIFT > + <Vol+>** and **<SHIFT > + <Vol->** in 1000l steps
	**<Dead-man>** AEO Function: Attentiveness – Emergency – Off
	**<Flashlight LED>** For increased illumination
	**<SHIFT > + <Roll up>** Roll up the hose reel
	**<SHIFT > + <Unroll>** Unroll the hose reel
	**<Battery charge and field strength>** STATUS of the remote control here: Battery ***FULL*** + Signal quality ***GOOD***
	**<Battery charge and field strength>** STATUS of the Overfill prevention amplifier OPU here: OPU ***ON*** + Battery ***FULL*** + Signal quality ***GOOD***
	<**Sensor-OK**> - STATUS of the overfill detector OFD here: OFD ***ATTACHED*** + Sensor ***DRY***

Introductory Information

☞ To turn on the remote control press any key. The backlight automatically turns on. The display will show the status symbols for battery and field strength of the remote control ***only*** if the base

station is ***turned on***. If the base station is not turned on, the display will show ***"Sening"***.

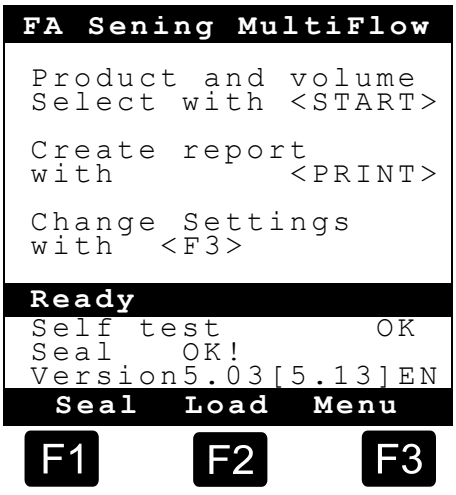
- The backlight automatically shuts off if no key is pressed for 1 minute. The backlight is turned back on by pressing any key, without that function being activated.
- Only the keys ***<Emergency Stop>*** 

and ***<Deadman>*** 

immediately start their respective functions after being pressed.
- The remote control switches off if no key is pressed for 5 minutes, even if a discharge is still active.
- The remote control is used to control and configure the system and to set parameters. In addition, test functions can be carried out and printouts can be started.
- The remote control constantly shows the state of charge of its own battery as well as the OPU's battery. While discharging, the discharged volume, flow rate as well as other information are shown.

1. MultiFlow Start screen

To start the discharge:



☞ Turn on MultiFlow.

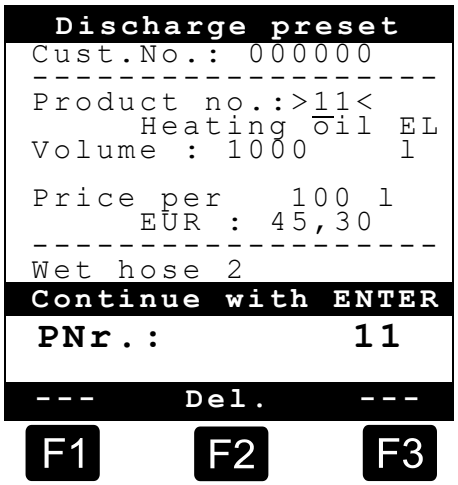
☞ Press the <***Start***> key.

2. MultiFlow Preset screen

Use:

☞ The display changes to the preset screen. Here the last preset entered appears (default 50,000L) and potentially the current hose path.

(example display)



Volume preset display on the MultiControl remote control

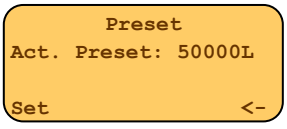
The display of the remote control changes to the preset screen.

☞ The preset volume can be changed in **± *100L*** steps with the keys 7 Vol. + 9 Vol. - .

☞ By activating the **<SHIFT>** function with **<F2>** = **Shift** (remains active for approx. 2 seconds),

☞ the preset volume can be set in **± *1000L*** steps with the keys 7 Vol. + 9 Vol. - .

☞ The preset volume can also be directly entered by pressing the key **<F1>** = **Volume**. The value is confirmed with **<F1>** = **Set** (correct with **<F2>** = ←)



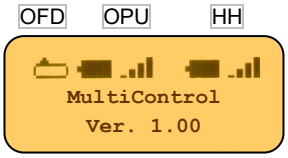
☞ Preset values changed on MultiControl are immediately transmitted to MultiFlow (from software version 3.57 / 5.07 and higher).

3. Turn on OPU

☞ The **running** overfill protection amplifier OPU is connected to the OFD connector of the tank to be filled. This puts the OFD sensor into operation, indicated by the "**Sensor OK**" icon.

Start screen on the MultiControl remote control

The icons at the top of the display provide information on:



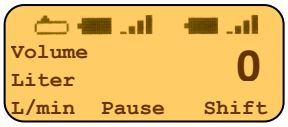
HH = Remote control > ***turned on***
OPU = Overfill prevention amplifier unit > ***turned on***
OFD = Overfill detector > ***connected***

The display example on the right shows the proper status for the discharge.

4. Start the discharge

Use:

☞ To start the discharge press the **<Start>** 1 Start key on the remote control.



☞ Depending on the type of control used, MultiFlow can show the hose selection with the available hose paths. Using fully electric control, the "hose selection" is shown in MultiFlow with the last hose path selected. It may be necessary to select the hose path in MultiFlow with **<F1>** or **<F2>** and confirmed with the ***<Enter>*** key.

- It is also possible to choose the hose path and start the discharge by pressing ***<Start>*** 1 Start once more on the handheld remote control. In this case **„Pause“** is shown on the display.

When the the control type without hose path selection has been chosen, the discharge starts immediately.

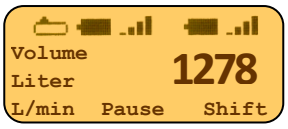
By default, the volume discharged is shown.

☞ By pressing **<F1>** during a discharge, the current flow rate is shown. Pressing it again brings back the volume display (switching function).

5. Discharge end / pause

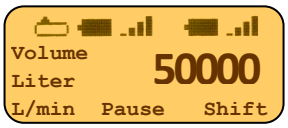
Use:

☞ By pressing ***<Stop>*** 3 Stop the discharge can be interrupted at any time before the preset quantity has been reached.
"Pause" is shown in the display.



- Discharge can be resumed by pressing <***Start***> 1 Start once more on the remote control (still using the same preset).
- Pressing <***Stop***> 3 Stop irrevocably ends the discharge.

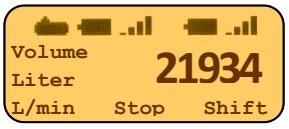
☺ After reaching the preset volume the discharge is interrupted and ***"Pause"*** appears in the display.



- Pressing <***Stop***> 3 Stop irrevocably ends the discharge.

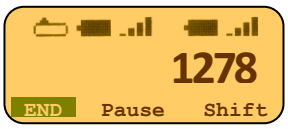
OR →

☺ The overfill protection activates. The symbol ***"OFD WET"*** appears in the display and the status ***"Stop"*** is shown.



- Pressing <***Start***> 1 Start changes the status to ***"Pause"***.
- If the OFD sensor unlocks again, the discharge can be resumed with ***<Start>***.
- Pressing <***Stop***> 3 Stop irrevocably ends the discharge.

Up until software version 1.11, discharge is ended with the <***Stop***> 3 Stop button, in subsequent versions the **<F1>** F1 button.



- If the **relevant parameters** have been set on the MultiFlow, the print-out starts automatically.

6. Further information

Motor Start / Stop

The motor is started and stopped with the functions „Motor Start" and „Motor Stopp". The **"Motor-Start"** output terminal is active as long as the **<Start>** key is pressed. After pressing „Motor Stop" the output terminal is active for 5 seconds.

☞ **<SHIFT> +** 1 Start → Motor started

☞ **<SHIFT> +** 3 Stop → Motor stopped

Emergency stop

☞ The key ***<Emergency stop>*** 2 Stop triggers an ***emergency stop***. The discharge is halted and the motor is stopped.

Dead-man function (optional)

☞ Time monitoring is started simultaneously with the start of the discharge. This time monitoring is continuously reset by pressing the dead-man key 8.

⮹ If the key isn't pressed within 30 seconds, an optical warning is issued. Then the user must press the dead-man key within 10 s to turn off the warning and restart the time management. If the 10 s elapse without pressing the dead-man key, then there will be a force stop of the discharge.

▶ The discharge can be resumed by pressing **<Start>** 1 Start.

7. MultiControl overfill prevention amplifier unit

⮹ The OPU is a circuit amplifier of the overfill prevention .

⮹ The OPU has a push button which switches the device on and off. It automatically switches itself off if no OFD sensor (overfill detector sensor) is detected for a long period of time.

⮹ The OFD sensor in the tank is operated with an intrinsically safe circuit. Depending on the state of the OFD sensor, a fill release is issued for the equipment to be filled.

☞ The OPU must not be operated in Ex-areas.

⮹ When the OPU is placed in the charging station , all LEDs remain off for a few seconds. During this time the charge state of the batteries is tested. Afterwards various states can be shown.

Meaning of the LED states in the **charging station**:

- **YELLOW**: ***OFF*** (LED is not lit)
- **GREEN**: Battery is fully charged
- **RED**: Battery is charging
- **RED** + **GREEN**:
  An error has occurred:
  1.) Battery error
  2.) Temperature too high
  3.) Temperature too low (under 5° C [41°F])

Meaning of the LED states in **operation**:

- **YELLOW**: ***ON***
- **GREEN**: OFD Sensor ***DRY***
- **GREEN**: When the green LED is blinking, the OFD sensor is being heated up
- **RED**: OFD Sensor ***WET***
- **RED**: Function error has occurred:
  → restart OPU

When working under unfavorable working conditions or if the wireless connection is insufficient, the OPU can be attached with an extension cable.

Plug the **running** OPU into the connector on the tank to be filled with the OFD plug. This warms up the OFD sensor and puts it into operation. This is shown by the remote control indicator “**Sensor OK**  . As long as the sensor is DRY, there is no overfill. The OPU sends a release signal to the base station and the ***green*** LED is illuminated. As soon as the OFD sensor becomes wet, the discharge is stopped and the ***red*** LED is illuminated.

If the connection to the base station is interrupted during a discharge due to a bad signal, the discharge is halted as well.

4 Reset and train nodes

The node number is displayed on the side of the **base station** housing.

The **node number** follows the letters, in this example: **533**

4.1 Reset and train node hand-held remote MC3HH/MC3WHH

Hand-Held remote control (HH)
MC3(W)HH

Base station
MC3(W)BASE

4.1.1 Reset node hand-held remote MC3HH/MC3WHH

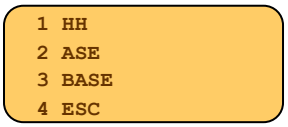
- Put the hand-held **MC3(W)HH** remote into the charging station and check the charging status.
  → Take out the hand-held remote,
  → press and hold the **<5>** button.
- Keeping **<5>** pressed, put the remote back into the docking station.

- Once the backlight goes out, release the **<5>** button.
  → As soon as the light goes on again, press and hold the **<5>** button until the light goes out.
  → Release the **<5>** button.
- Once the sand dial appears on the display, remove the **MC3(W)HH** from the charging station.
- Now the node has been reset to **"1"**.

4.1.2 Train node hand-held remote MC3HH/MC3WHH

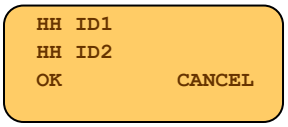
- Press the buttons **<7>** and **<8>** on the hand-held remote **MC3(W)HH** simultaneously until the password query appears.
- **Enter Password:** 1234

☞ The display shown to the left appears



- Press button **<1>** for **HH** (hand-held remote control)

☞ Now the display for ID entry screen appears.



☞ **Entry ID:**

- ID = Type 1 (or old nodes)
  (for older devices MC2HH: also ID 2)
  → acknowledge with **<OK>**
- ID1 = New node from BASE
  → acknowledge with **<OK>**
- ID2 = Repeat new node
  → acknowledge with **<OK>**

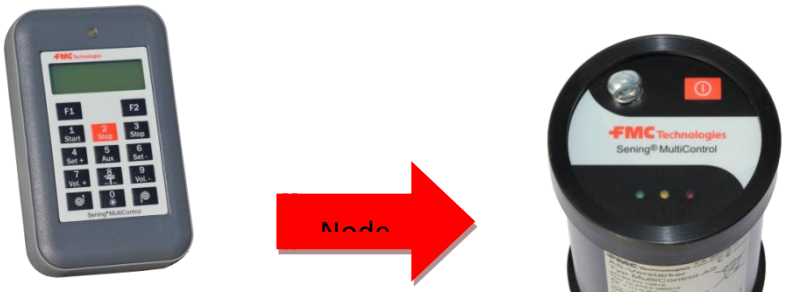
*(If the entry is **incorrect**, the cursor returns to "ID")*

☞ Leave the menu by pressing **<ESC 4>**.

☞ **Control on the screen:**
Correct ID

☞ ***Incorrect*** ID

4.2 Reset and train node OP amplifier unit MC3ASE/MC3WASE



Hand-Held remote control (HH) MC3(W)HH

OP amplifier unit (OPU) MC3(W)ASE

4.2.1 Reset node OP amplifier unit MC3ASE/MC3WASE

- Put the OP amplifier unit **MC3(W)ASE** into the charging station and check the charging status.
  → Remove OPU.
- Press and hold the red **ON** button
  → until the ***yellow*** LED lights up.
- While pressing the **ON** button, put the OPU into the charging station.
  → If the ***yellow*** LED light goes out, release the **ON** button.
- Once the ***yellow*** LED lights up again,
  → press the red **ON** button once more until the ***yellow*** LED goes out.
  → Release the **ON** button.
- ***All*** the LEDs light up for a few seconds. In the end, the ***red*** and the ***yellow*** LEDs should be the only remaining lits.
- Remove OP amplifier unit **MC3(W)ASE** from the charging station.
- In older OP amplifier **MC3(W)ASE**
  → again into the charging station and
  → take out check state of charge.
- Switch on OP amplifier unit **MC3(W)ASE**.
  → The ***yellow*** LED lights up.
- Now the node has been reset to **“1”**.

4.2.2 Train node OP amplifier unit MC3ASE/MC3WASE

The MC3(W)ASE must first be put into train mode:

- Turn OFF the MC3(W)BASE
- Turn ON the MC3(W)ASE

☞ Since the MC3(W)BASE is switched OFF, the yellow connection LED starts flashing after a few seconds

- Turn the MC3(W)ASE ON and hold down the **ON/OFF** button.

☞ The ***yellow*** LED will be turn OFF. Continue holding the **ON/OFF** button.

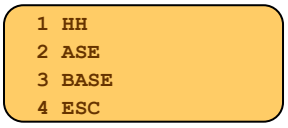
- After ~10s all 3 LEDs are switched ON and OFF alternately in 1s intervals.

☞ The MC3(W)ASE is now in train mode.

Now the node number of the MC3(W)ASE can be changed using the MC3(W)HH:

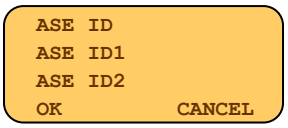
- The hand-held remote control is necessary in order to train the nodes. Press the buttons **<7>** and **<8>** until the password query appears.
- **Enter Password:** 1234

☞ The following display appears:



- Press **<2>** for OP amplifier unit (OPU / **ASE**)

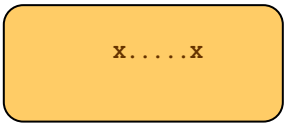
☞ Now the display for ID entry screen appears.



☞ **Entry ID:**

- ID = Type 1 (or old nodes)
  → acknowledge with **<OK>**
- ID1 = New node from BASE
  → acknowledge with **<OK>**
- ID2 = Repeat new node
  → acknowledge with **<OK>**

„X...X“ appear in the display after the entry is acknowledged

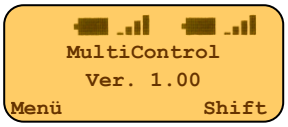


IMPORTANT !!!
The ***green*** LED on the OPU needs to flash up briefly.

If the attempt to train the node is unsuccessful, increase the distance between hand-held remote control **MC3(W)HH** and OP amplifier unit **MC3(W)ASE** and try again.

Leave the menu by pressing **<ESC 4>**.

Control on the screen:
Correct ID:



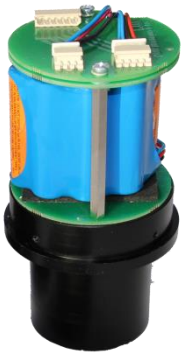
Incorrect ID:

5 MultiControl spare parts

Base station
MC3(W)BASE

Antenna
(without cable)
MC2ANTENNA

Battery Pack MC3(W)HH



Battery Pack MC3(W)ASE

Complete system

☞ The MultiControl system is comprised of the following components:

- Base station Part no. MC3BASE/MC3WBASE
- Hand-held remote control (HH) Part no. MC3HH/MC3WHH
- OP amplifier unit (OPU) Part no. MC3ASE/MC3WASE
- Charging station Part no. MC2CHARGE

- Antenna Part no. MC2ANTENNA
- OPU extension cable Part no. MC2CABLE
- 3 m antenna feeder line Part no. MC2AC3
- 5 m antenna feeder line Part no. MC2AC5
- Battery Pack MC3(W)HH Part no. 352323
- Battery Pack MC3(W)ASE Part no. P8000005635

The system is constructed for operation in the license-free 869 MHz band.

The system components labeled with MC3W instead of MC3 are the current BASE/ASE/HH components with a different radio module, which is incompatible with the previous MC3 system.

The Overfill prevention amplifier unit (OPU) has a push button which switches the device on and off. It automatically switches itself off if no OFD sensor (overfill detector sensor) is detected for a long period of time.

The OFD sensor in the tank is operated with an intrinsically safe circuit. Depending on the state of the OFD sensor, a fill release is issued for the equipment to be filled.

5.1 Base station (MC3BASE/MC3WBASE)

Fig. 2: Base station

- The base station is intended for installation in the driver's cab and can be installed there in any position. It is not necessary for it to be accessible to the driver. When used with a MultiFlow, connect the base station to the MultiFlow over a CAN-bus.
- The base station evaluates the signals from the remote control and the OPU and controls the overfill prevention actuator. Another function, which also works indirectly on the overfill prevention actuator, is the dead-man function
(AEO function: Attentiveness - Emergency - Off).
- Aside from the safety functions (overfill prevention, dead-man function), other functions are available at the base station depending on manufacturer of the vehicle's electronics. Using the remote control you can select the functions described in chapter 7.1 "Hand-Held remote control (MC3HH/MC3WHH)" / page 41. If a MultiFlow is installed as a counter, then the functions described in chapter chapter 7.3 "Discharge start" / page 48 may also be selected.

5.1.1 CAN-bus communication

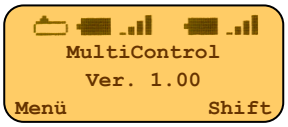
- The CAN-bus connection between MultiFlow and MultiControl is established as soon as the preset screen is called up on MultiFlow. When the connection between both devices is established, MultiControl will also show the preset screen.
- When discharging is finished, MultiControl returns to it's start screen.
- In connection with a MultiFlow version 3.57 [3.59] or 5.02 [5.07] or higher, MultiControl can print setup, logbook and device Information. This is only possible when MultiFlow is in idle mode.

5.2 Hand-Held remote control (MC3HH/MC3WHH)

Fig. 3: Remote control

- The remote control consists of a 4 line LCD display and a keypad with 14 keys. To turn on the remote control press any key. The backlight automatically turns on. The display will show the status symbols for battery and field strength of the remote control ***only*** if the base station is ***turned on***. If the base station is not turned on, the display will show ***"Sening"***.
- The backlight automatically shuts off if no key is pressed for 1 minute. The back light is turned back on by pressing any key.
- The remote control switches off if no key is pressed for 5 minutes, even if a discharge is still active.
- The remote control is used to control and configure the system and to set parameters. In addition, test functions can be carried out and printouts can be started.

GWG ASE HB



- The remote control constantly shows the state of charge of it's own battery as well as the OPU's battery.
- While discharging, the discharged volume, flow rate as well as other information is shown.

GWG = **OFD** = Overfill Detector
OPU = Overfill Prevention amplifier unit
HH = Hand-Held remote control

5.3 Overfill prevention amplifier unit (MC3ASE/MC3WASE)

Fig. 4: OPU

- The OPU is a circuit amplifier of the overfill prevention to which PTC overfill sensors as per TRBF 511 can be connected (thermistors, hereafter referred to as OFD sensors).
- The OPU has a push button which switches the device on and off. It automatically switches itself off if no OFD sensor (overfill detector sensor) is detected for a long period of time.
- The OFD sensor in the tank is operated with an intrinsically safe circuit. Depending on the state of the OFD sensor, a fill release is issued for the equipment to be filled.

EX

The OPU may not be operated in Ex-areas.

Fig. 5: OPU LEDs

- When the OPU is placed in the charging station , all LEDs remain off for a few seconds. During this time the charge state of the batteries is tested. Afterwards various states can be shown.
- Meaning of the LED states in the **charging station**:
  - **YELLOW**: ***OFF*** (LED is not lit).
  - **GREEN**: Battery is fully charged.
  - **RED**: Battery is charging.
  - **RED + GREEN**: An error has occurred:
    1.) Battery error.
    2.) Temperature is too high.
    3.) Temperature is too low (under 5° C [41° F].
- Meaning of the LED states in **operation**:
  - **YELLOW**: ***ON*** (OPU is on).
  - **YELLOW**: If the ***orange*** LED blinking, there is no radio transmission to the base station.
  - **GREEN**: OFD Sensor ***DRY***.
  - **GREEN**: The OFD sensor is being heated.
  - **RED**: OFD Sensor ***WET***.
  - **RED**: Function error has occurred → restart OPU.

5.4 Extension cable (MC2CABLE)

Fig. 6: Extension cable

- When working under unfavorable working conditions or if the wireless connection is insufficient, the OPU can be attached with an extension cable. For example, if the connectors are hard to access, if there's a poor wireless connection to the vehicle or the connector is mounted on the roof.
- The extension cable must be used if the OFD sensor is placed in an explosive area zone 1, in order to operate the OPU outside of this area.

5.5 Charging station (MC2CHARGE)

Fig. 7: Charging station

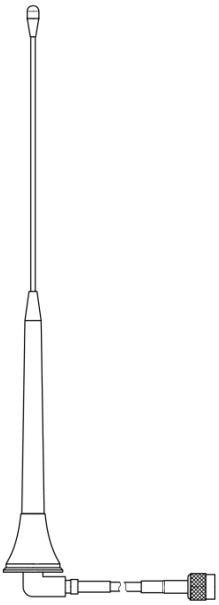
- The charging station should be installed in the driver's cab so that it is easily accessible to the driver.
- If the remote control and the OPU are not needed, they should be placed in the charging station. The internal batteries will be automatically charged.
- In combination with the MultiControl base station part no. MC3BASE/MC3WBASE is a device loss detection available. The switch output (see terminal assignment) is activated as soon as at least one of the two devices is no longer located in the charging staion. This output is then deactivated again once both devices are located in the charging station.

5.6 Antenna (MC2ANTENNA)

The antenna should be fastened as high as possible on the vehicle. An ideal location would be, for example, in the middle of the roof of the driver's cab.

Fig. 8: Antenna

☞ Ensure a good grounding plate and a good connection. The separation from vertical metal surfaces should be as great as possible, at least 70 cm (28"). There will always be a certain directionality with a particular vehicle. For example, an antenna mounted on the right tail of a vehicle (passenger car) will result in a forward left directionality.



- The transmitter used is a low power transmitter in the 869 MHz band.
- To emit the maximum output at the antenna, the antenna cable should be as short as possible.
- The following antenna feeder lines are available
  - cable length 3 m, part no:
    MC2AC3 (recommended length)
  - cable length 5 m, part no:
    MC2AC5 (maximum length)
- When installing the antenna cable, take care that it doesn't cross other cables.

☞ When installing the antenna base take the utmost care that it has a good ground connection. ***No*** plastic or other non-conductive material may be used as a mounting plate.

6 Operation

6.1 Montage

The following points must be considered when installing the overfill prevention:

- If possible, the base station should be installed in the driver's cab and should be placed so that the antenna can be connected with the 3 m or 5 m antenna cable.
- The charging station must be easily accessible to the driver, so that devices can be easily taken out and put back.
- The housing of the base station must also be connected to the vehicle's chassis with a grounding wire.
- The antenna must be installed as far as possible from other antennas.
- If cables are laid to explosion protected devices, the installation must be in compliance with VDE 165.
- The cables may not be damaged or kinked during installation.
- The wire ends must be terminated with wire terminators.
- When connecting the speed control to the vehicle's electronics, MultiControl's connections and the connected load must be compared to the vehicle's electronics. Otherwise damages to the vehicle's electronics and/or to the base station's electronics can occur. Also .
- In “**Stand alone**” operation (without MultiFlow) the solenoid valve which is needed to drive the OPU's actuator can be directly connected to the corresponding switching output with 12V/420mA.

6.2 Setting functions at the MultiControl base station MC3BASE/MC3WBASE

☞ Several basic settings must be set through DIP switches on the base station's circuit.

6.2.1 DIP switch configuration

☞ Die Position der DIP-Schalter auf der Platine see chapter 6.2.7 "Circuit board in MultiControl base station MC3BASE" / page 36.

Fig. 9: Base station open

☞ DIP switch **SW1**

The **terminating resistance** for the CAN-bus can be set with the DIP switch **SW1**. If the Multi-Control is located at the end of the CAN-bus, DIP switches no. ***1*** and ***2*** must be switched ***ON***.
This is equivalent to: **CAN-bus closed**.

Example: MultiFlow ←→ MultiControl

If MultiControl is ***not*** located at the end of the CAN-bus, then DIP switches no. ***1*** and ***2*** must be switched ***OFF***.
This is equivalent to: **CAN-bus is not closed**.

Example: MultiFlow ←→ MultiControl ←→ EMIS2

DIP switch **SW1** table:

CAN-bus terminating	DIP switch SW1 no. 1	DIP switch SW1 no. 2
YES	ON	ON
NO	OFF	OFF

☞ DIP switch **SW2**

DIP switch **SW2** no. ***1*** is the **setup switch**. In the ***OFF*** position, setup is **disabled**. In order to make setup changes using the remote control, DIP switch no. ***1*** must be moved to the ***ON*** position (see the following table).

DIP switch no. *2* has the following function:

- During the installation of download software, the DIP switch must be switched to "**OFF"** to activate a software download to the remote control or to **"ON"** to activate a software download to the OPU.
- In normal operation, DIP switch **SW2** no. ***2*** must be switched to **"OFF"**.

DIP switch **SW2** table:

Setup	DIP switch SW2 no. 1	DIP switch SW2 no. 2
disabled	OFF	OFF
released	ON	OFF
Remote control software download	OFF	OFF
OPU software download	OFF	ON

☞ DIP switch **SW3**

The control of vehicles from SCANIA presents a **special case** concerning **engine speed control**. For **series 4** vehicles, the control variant "***resistance control***" **must** be switched on and at the DIP switches ***SW3*** no. **1** and no. ***2 must*** be switched to the ***OFF*** position. All other Motor Management Electronics (MME) of various manufacturers are driven by pulse control or ramp control. For this, the DIP switch **SW3** no. ***1*** and ***2*** must be switched to the ***ON*** position.

DIP switch **SW3** table:

Resistance control	DIP switch SW3 no. 1	DIP switch SW3 no. 2
Yes	OFF	OFF
No	ON	ON

All further settings are carried out on the remote control.

6.2.2 Password

- The password can only be changed in the setup menu if DIP switch **SW2** no. ***1*** is set to ***ON***.
- The current password is shown as asterisks **"******"**. The new password will be shown in clear text when it is entered.
- After the password has been saved, DIP-switch **SW2** no. ***1*** must be set back to ***OFF***.
- The default password is **"111111"** and can be changed as desired. In addition, the system has a master password. This unchangeable master password is **"304288"** and is always accepted, even if the original password has been changed!
- Only the parameters **"Language"** and **"date/time"** are password protected. To change a setup parameter, DIP switch **SW2** no. ***1*** must be set to ***ON***.

6.2.3 Restore the factory settings

The menu item *"**Reset**"* is only available if DIP switch **SW2** no. ***1*** is set to ***ON***. The reset request must be confirmed twice before it is carried out. If DIP switch **SW2** no. ***1*** is set to ***OFF***, then settings can not be restored to factory defaults.

Wireless connection parameters are not be reset with the other settings!

6.2.4 Pairing wireless devices

It is possible to replace individual devices of the MultiControl system. New devices can be integrated with a special menu item from the remote control. This is described in chapter 7.6.2 "Interconnecting the remote control" / page 59.

6.2.5 Setting date and time

In "Stand alone" operation

With this type of operation, date and time can only be modified on the MultiControl remote control. The menu item **"Date / time"** is password protected (depending on DIP switch **SW2** no. ***1*** on the circuit board of the base station BASE). The settings are changed directly through the menu of the Multi-Control remote control.

In operation with MultiFlow

In operation with a MultiFlow, MultiControl takes the current time and date settings from the MultiFlow. This happens automatically while a connection is being established between the devices. The date and time can be shown on the MultiControl, but they cannot be changed.

If there are **(2)** MultiFflows in the system, the MultiControl synchronizes Date and Time with the MultiFlow that the CAN node number **"1"** has.The date and time settings from MultiFlow **2** are only accepted if the date and time information from MultiFlow **1** have never been received before, but as soon as values can be received from MultiFlow **1**, MultiControl synchronizes with the parameters of MultiFlow **1**.

6.2.6 AUX output

The switching characteristics of the AUX output can be defined in System Setup. Sensing and switching characteristics can be selected here.

If the **<AUX>** key is pressed, while the status of the **<SHIFT>** key is active, the status of the AUX output changes. If the sensing characteristics are

configured, the AUX output only remains enabled while the button is being pressed. If the switching characteristic is activated, the status of the AUX output only changes whenever the **<AUX>** key is pressed (while the **<SHIFT>** state is activated).

6.2.7 Circuit board in MultiControl base station MC3BASE/MC3WBASE

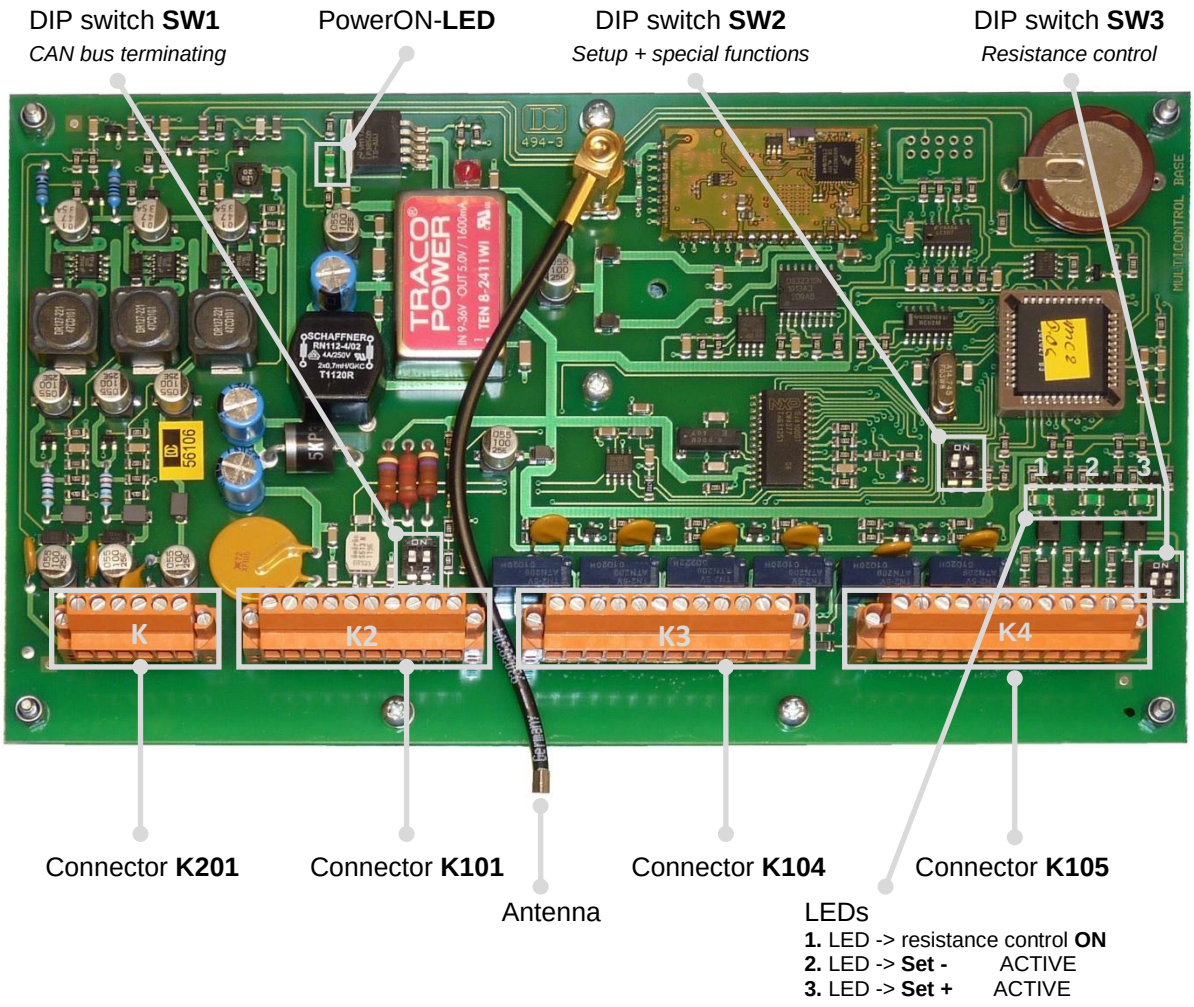


Abb. 10: DIP switches on the base station circuit board MultiControl MC3(W)BASE

6.3 Parameterization of MultiFlow

In order to use all the functions of MultiControl, MultiFlow must be parameterized accordingly. The following settings must be set or checked.

☞ All parameters, which must be changed have been underlined. Parameter 3.1.6.6.1 must be set according to use. After changing the parameters, MultiFlow must be turned off and back on again.

Param.	**Name**	**Factory default ()**	**Meaning**	
3.1.6.1	Global node no.	1	MultiFlow node number (address) when using multiple devices on the CAN-bus. Must be set to 1 for the first MultiFlow, 2 for the second MultiFlow in a double meter, etc..	
3.1.6.4	Remote control			
3.1.6.4.1	Use remote control	1 ja *(0 no)*	Activation of the optional remote control	
3.1.6.4.2	Remote control nodes	0	Node number of the remote control's base station, if the remote will be used.	
3.1.6.5	Overfill prevention			
3.1.6.5.1	Transmission interval	18 (s/10)	Repetition rate of the overfill prevention signal. If the signal fails to appear, discharge is stopped with an OP error.	
3.1.6.5.2	OP nodes	0	Overfill prevention base station node number, if overfill prevention was activated under 3.1.8.8.	
3.1.6.6	Dead-man switch			
3.1.6.6.1	Use dead-man	1 ja *(0 no)*	Activation of the optional control key. (dead-man key).	
3.1.6.6.2	Transmission interval	18 (s/10)	Repetition rate of the control signal. If the signal fails to appear, discharge is stopped with dead-man error.	
3.1.6.6.3	Dead-man nodes	0	Monitoring device base station node number, if the monitoring device was activated.	
3.1.8.8	Overfill prevention	Wireless overfill prevention *(No)*	**Does the overfill prevention control monitoring:**	
			No	There is no monitoring, MultiFlow is not part of the overfill prevention chain.
			Frequency input	An OPU with frequency output is used.
			Switch input	An OP with switching output is used.
			Wireless overfill prevention	The OP signal is transmitted to MultiFlow via a wireless signal and base station.

The status of the CAN-bus as well as the correct operation of the remote control can be checked in MultiFlow in the menus "**4 - Service**" and "**3 - Diagnosis**".
Further information can be found in the MultiFlow handbook.

All functions such as printing or direct preset are only available as of version 3.57 [3.59] or 5.02 [5.07].

6.4 Switching output for the overfill prevention solenoid valve

☞ The switching characteristics of the output for the overfill prevention solenoid valve can be defined using parameter '**AS valve control**' in the Vehicle Setup:

- **"No":**
  The solenoid valve output for the overfill prevention is not switching.
- **"Yes. Directly".**
  The overfill prevention solenoid valve output is switched as soon as delivery has been enabled by the ASE.
- **"Yes, Start/Stop":**
  The overfill prevention solenoid valve output is switched as soon as delivery has been enabled by the ASE and this has also been started by pressing the **<START>** key on the manual control panel or MultiFlow.

In operation without MultiFlow, the output is used to switch the solenoid valve for the function of overfill prevention. The output is switched as long as the base station receives the fill release from the OPU.

If the overfill prevention function is taken over by an attached MultiFlow, the output will still be switched. For example, the output can be used as a release indication and to drive the OP solenoid valve and for driving a 12 volt control light. The output is switched directly or when discharge is started in MultiFlow, depending on the setting.

The correct use of the solenoid valve is described in the wiring diagram (see attachment).

- The electrical parameters are:
  voltage 12V / current, max. 420 mA

6.5 Connection to a double meter (only in operation with MultiFlow)

When connecting a double meter to a base station, each MultiFlow is assigned its own CAN-bus node number (see chapter 6.3 "Parameterization of MultiFlow" / page 37), which must be registered in MultiControl network setup.

When discharge is started at one of the two MultiFlows, the OPU is automatically assigned to it. As a result, the OPU is blocked for the second MultiFlow. If there is an attempt to start a discharge at the second MultiFlow, a warning is immediately generated. No discharge may be started which requires overfill prevention. Discharge at the second meter may only proceed after discharge at the first meter has finished. Then the OPU is automatically assigned to the second meter.

6.6 Simultaneous operation of multiple OPUs

If multiple OPUs are to be operated simultaneously, this must first be arranged with our service department.

6.7 Connecting wired overfill protection

In addition to the wireless overfill prevention system, a wired overfill prevention system can also be connected to the frequency input (see terminal assignment) of the base station (MC3(W)BASE).

When wired and wireless overfill prevention system are operated in parallel to one another, the changeover occurs automatically. The wired overfill prevention system can only be used when the wirless overfill prevention system is switched off. Simultaneous operation of both overfill prevention systems is not possible for safety reasons. A status of this kind appears on the display of the manual control unit in the form of a corresponding symbol.

In cases where wired as well as wireless overfill prevention systems are used simultaneously in conjunction with a GWG sensor, or if a GWG sensor was connected while the wired overfill prevention system is turned on, the user must define clearly which overfill prevention system should be used.

☞ In such cases, in order to use the wireless overfill prevention system, both overfill prevention systems first need to be disconnected from the connected GWG sensors and the wireless overfill prevention system then needs to be restarted once more. Now it can be reconnected to the GWG sensor. However, if on the other hand, the wired overfill prevention system is used, the wireless overfill prevention system must be switched off. The connection between the wired overfill prevention system and GWG sensor must then be interrupted once and then re-established.

When using the wireless overfill prevention system, the battery and field strength symbols will appear on the display on the manual control panel. If

a GWG sensor was connected to the wireless overfill prevention system, the tank symobls for an empty and/or a full tank (/) are also displayed. When using the wired overfill prevention system, no symbols initially appear on the display of the manual control panel. An empty tank symbol is only displayed after connection of a PTC overflow sensor and after enabling by the wired overfill prevention system. If no Enable signal from the wired overfill prevention system is present (e.g. 'tank full'), no tank symbol is displayed.

For safety reasons, simultaneous operation of both overfill prevention systems is not possible.

During an ongoing delivery operation, it is not possible to switch between wired and wireless overfill prevention systems.

Wired FMC overfill prevention systems for use in the hazard class AI:

- ASE

This function is only available in conjunction with a MC3(W)BASE base station.

The measuring systems are designed for flow measurements of highly flammable and flammable liquids (hazard classes AI and AIII) on tank trucks. Sparks and naked flames must be strictly avoided.

6.8 Device loss detection

The MultiControl base station is capable of monitoring whether the manual control panel and AS amplifier are located in the charging station. Signaling occurs by means of the appropriate switch output (see terminal assignment).

The switch output is activated as soon as at least one of the two devices is no longer located in the charging staion. This output is then deactivated again once both devices are located in the charging station.

This function is only available in conjunction with a MC3(W)BASE base station.

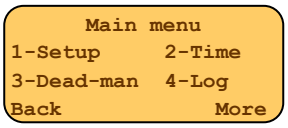
7 Description of functions

7.1 Hand-Held remote control (MC3HH/MC3WHH)

see "The main keys" / page 12

7.1.1 MENU Function - F1

<F1> calls up the **<Menu>** function and the menu selection screen appears in the display. The MultiControl menu can only be called up if a discharge is not taking place and there is communication between MultiControl and MultiFlow.



The function labels in the display above the **<F1>** and **<F2>** keys are only visible if the functions are available. However, the **<Shift>** function is available outside the menu in most cases.

7.1.2 SHIFT Function - F2

<F2> activates the **SHIFT** function. The current **SHIFT** status is shown in the display as follows. When the function is deactivated it is shown in lowercase “**Shift**” and when activated in uppercase “**SHIFT**”. If for example: **<Shift> + <Vol+>** should be pressed, that means that first the **<Shift>** key should be pressed and then the **<Vol+>** key, never both at the same time.

Die uppercase **SHIFT** function is only active for **max. 2s**. The time period is automatically lengthened by **2 s** in the preset screen as soon as the keys **<Vol.+>** or **<Vol.->** are pressed. In all other cases, the **SHIFT** function is deactivated as soon as a valid function is carried out or when the **<Shift>** key is pressed again.

7.1.3 Motor start - 1 Start

☞ The motor is started by pressing **<Shift> + <Start>** one after the other. The **"Motor-Start"** output terminal K3 1/2 is active as long as the **<Start>** key is pressed. The motor always starts in idling speed. Previously configured engine speeds are not saved.

A discharge can begin independent of motor status.

7.1.4 Motor stop - 3 Stop

☞ The motor is stopped by pressing **<Shift> + <Stop>**. The **"Motor stop"** output terminal (see terminal assignment) is always active for 5 seconds. This ensures that the contact remains safely closed until the motor comes to a standstill, even in an emergency situation.

7.1.5 Emergency stop - 2 Stop

☞ The key ***<Emergency stop>***  triggers an ***emergency stop***. Essentially, the result is the same for the discharge as pressing the normal **<Stop>** key, but additionally the motor is stopped.

7.1.6 Increased engine speed with "flow switch" (without MultiFlow) - 4 Set+ / 6 Set-

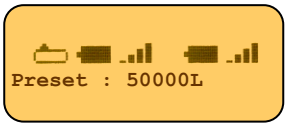
☞ If the **"flow switch"-** input terminal (see terminal assignment) activated, engine speed can be increased with **<Set+>** and decreased with **<Set->**. The engine speed is changed as long as the keys **<Set+>** or **<Set->** are pressed. If this input is ***not*** activated, the motor runs at idling speed.

When the motor is started, engine speed begins at the idling value. No previous "**Set+/-**" settings are stored.

The motor may be stopped at any time. The engine speed does ***not*** have to be reduced by pressing the **<Set->** key.

7.1.7 Enter volume preset - 7 Vol.+ / 9 Vol.-

☞ The appropriate settings must be made in MultiFlow for the discharge. After pressing the **<START>** key on MultiFlow, the MultiFlow display changes to the preset-screen with the defined standard preset volumes (for example: 50.000L).



The display of the remote control changes to the preset screen.

☞ The preset volume can be changed in **± *100L*** steps with the keys:

▶ **<Vol+>** 7 Vol. + und **<Vol->** 9 Vol. -

OR

☞ in **± *1000L*** steps by activating the **<SHIFT>** function with **<F2>** = **Shift** (remains active for approx. 2 seconds) with the keys:

▶ **<Vol+>** 7 Vol. + und **<Vol->** 9 Vol. -

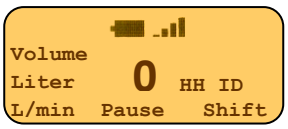
Brief overview:

- **<Vol+>** → Preset + 100L
- **<Shift> + <Vol+>** → Preset + 1000L
- **<Vol->** → Preset – 100L
- **<Shift>** + **<Vol->** → Preset – 1000L

☞ The preset volume can also be directly entered by pressing the key **<F1>** = **volume** The value is confirmed with **<F1>** = **Set** (correct with **<F2>** = ←) (as of MultiFlow Version 3.57 [3.59] or 5.02 [5.07])

Preset values changed on MultiControl are immediately transmitted to MultiFlow.

7.1.8 Dead-man function - 8



If connected to a MultiFlow, then a discharge is prepared, e.g. the entry of the preset volume is activated. Further operation can then take place at the manual terminal. The discharge is started with the **<*Start*>** 1 Start key and the countdown for the dead-man time begins.

Time monitoring is started simultaneously with the start of the discharge. This time monitoring is continuously reset by pressing the dead-man key.

When the dead-man function is activated, messages are regularly sent from MultiControl to MultiFlow during discharge to trigger the internal dead-man timer.

In operation without MultiFlow ("**Stand-Alone**" installation) the discharge is started either by pressing **<Start>** 1 Start (***"yes, Start/Stop"***) or through an OPU release (***"yes, direct"***), depending on the parameter "**OP valve control**". This also activates the dead-man key and time management runs.

☞ In both modes of operation, the discharge is stopped with the ***<Stop>*** 3 Stop key or in emergencies with the ***<Emergency stop>*** 2 Stop key.

☞ ***<Dead-man>***	**Start** the discharge with AEO ***"Stand-Alone"***
☞ **<Start>**	**Start** the discharge with AEO and MultiFlow
☞ ***<Dead-man>***	**Reset** dead-man warning signal
☞ **<Stop>**	**Stop** the discharge
☞ ***<Emergency stop>***	**Stop** the discharge**,** **Switch off** the machine

☞ The dead-man function can, according to the SETTING, be adjusted as follows:

▶ **NO**

- Dead-man function is not needed.

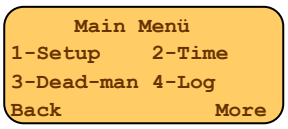
▶ **YES**

- If the key isn't pressed within 30 seconds, an optical warning is issued. Then the user must press the dead-man key within 10 s to turn off the warning and restart the time management. If the 10 s elapse without pressing the dead-man key, then there will be a force

stop of the discharge. Finally, the discharge can resume by pressing the **<Start>** 1 Start Start or dead-man key.

▶ **Yes, with bypass**

- With this function activated it's possible to discontinue the dead-man function for one discharge.



The bypass of the dead-man function can be activated in the dead-man menu. Turning off MultiControl automatically deactivates it!

▶ A logbook entry is made when the bypass is activated. This entry is made with a timestamp and shows the duration of the bypass. As of version 3.57 [3.59] or 5.02 [5.07], logbook data can be printed through MultiFlow.

▶ In systems without MultiFlow, the logbook entries can be reviewed in the logbook menu of the remote control.

7.1.8.1 Logbuch

In the logbook menu entries about dead-man bypassing can be checked.

Log 1
14.04.2011 11:34
bypass ON

In addition, the reset of the logbook and changes the radio nodes to the base station are recorded in the logbook.

As of version 3.57 [3.59] or 5.02 [5.07], this log book data can be printed through MultiFlow.

7.1.9 Unrolling the hose reel

To unroll the hose reel, no discharge may be active. The keys **<SHIFT > + <Unroll>** must be pressed one after the other. The **"Unroll"** output terminal (see terminal assignment) is active as long as the **<Unroll>** key is pressed.

7.1.10 Rolling up the hose reel

To roll up the hose reel, the discharge must be finished. To roll up the hose, the keys **<SHIFT > + <Roll up>** must be pressed one after the other. The **"Roll up"** output terminal (see terminal assignment) is active as long as the **<Roll up>** key is pressed.

7.2 Overfill prevention amplifier unit (MC3ASE/MC3WASE)

Plug the **running** OPU into the connector on the tank to be filled with the OFD plug. This warms up the OFD sensor and puts it into operation. This is reported to the remote control indicator "**Sensor OK**" . As long as the sensor is DRY, there is no overfill. The OPU sends a release signal to the base station and the ***green*** LED is illuminated. As soon as the OFD sensor becomes wet, the discharge is stopped and the ***red*** LED is illuminated.

Also see chapter 7.2 "Overfill prevention amplifier unit (MC3ASE/MC3WASE)" / page 46.

7.2.1 OPU operating status MC3ASE/MC3WASE

The OPU's operating status is displayed with 3 LEDs. After the amplifier is turned on by pressing the **<ON>** key, these LEDs show the status in the charging station and in operation as follows:

7.2.1.1 LED status in the charging station

When the OPU **MC3(W)ASE** is placed in the charging station, all LEDs activate for a few seconds. During this time the charge state of the batteries is tested. Afterwards, various conditions can be displayed.

Meaning of the LED status in the **charging station**:

LED (color / function)	**Status**	**Description**
YELLOW Power	***OFF***	LED doesn't illuminate
GREEN State of charge	continuously **ON**	Battery is fully charged

RED State of charge	continuously **ON**	Battery is charging
RED + **GREEN** Function error	continuously **ON**	1. Battery error 2. Temperature too high 3. Temperature too low (under 5°C [41°F])

7.2.1.2 LED status in operation

In operation, the OPU is plugged into the tank to be filled with the OFD plug.

Meaning of the LED states in **operation**:

LED **(color / function)**	**Status**	**Description**
YELLOW Power	continuously ***ON***	MC3(W)ASE turnd **ON**
	BLINKS	No wireless connection to the base station possible.
GREEN Sensor	continuously ***ON***	OFD sensor ***DRY***
	BLINKS	Sensor is being prepared for operation, warming to be ready for the discharge
RED High fill level	continuously ***ON***	OFD sensor ***WET*** maximum fill level reached
	BLINKS	Function error has occurred and the MC3(W)ASE must be restarted

If the **MC3(W)ASE** is separated from the OFD sensor for more than 2 minutes, it will automatically shut off.

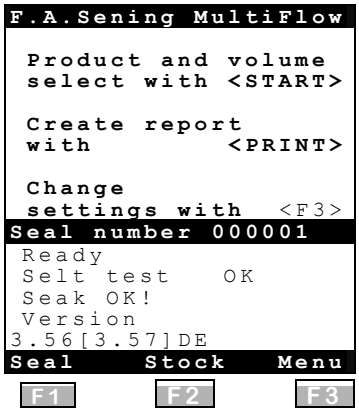
If the wireless connection to the base station is paused during the discharge, then for safety reasons the discharge will be paused.

So that the current fill status can be regularly reported to MultiFlow, the following conditions must be met:

1. The CAN-bus connection between MultiFlow and MultiControl must be established.
2. The **MC3(W)ASE** is connected to the tank to be filled with the OFD plug. This is reported on indicator " **Sensor OK**" .
3. It is not compulsory to establish a wireless connection from the remote control to the base station. The remote control is just a control.

7.3 Discharge start

7.3.1 ① Start screen in MultiFlow



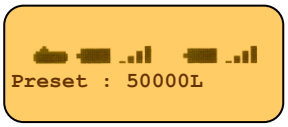
☞ Turn on MultiFlow.

☞ Press the **<START>** key.

7.3.2 ② Preset screen in MultiFlow

☞ The display changes to the preset screen. Here the last preset entered appears (default 50,000L) and potentially the current hose path.

7.3.2.1 Preset screen on the MultiControl remote control



The remote control's display changes to the preset screen.

▶ The preset volume can now be entered in the MultiControl remote control's preset screen.
see chapter 7.1.7 "Enter volume preset - 7 Vol.+ / 9 Vol.- " / page 43.

☞ These new preset values are immediately transmitted to MultiFlow.

☞ New MultiFlow software is needed for this function (as of version 3.57 [3.59] or 5.02 [5.07]).

7.3.3 ③ Turn on MC3ASE/MC3WASE

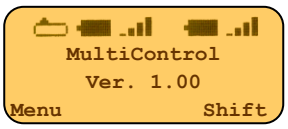
☞ The **running** overfill protection amplifier OPU is connected to the OFD connector of the tank to be filled. This puts the OFD sensor into operation and heats it. This is reported at the "**Sensor OK**" indicator.

7.3.3.1 Start screen on the MultiControl remote control

☞ The icons at the top of the display provide information on:

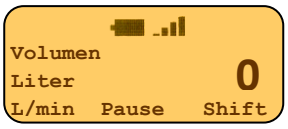
	OFD	=	Overfill detector	-> ***connected***
	OPU	=	Overfill prevention amplifier unit	-> ***turned on***
	HH	=	Remote control	-> ***turned on***

OFD OPU HH



☞ The figure shows the proper status for the discharge.

7.3.4 ④ Start discharge



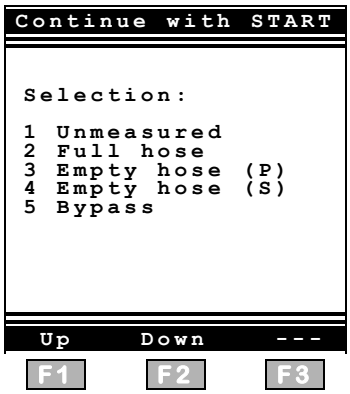
☞ To start the discharge press the **<Start>** 1 Start key on the remote control or directly in MultiFlow.

☞ Also, the **MC3(W)ASE** must send a fill release signal to the base station and the ***green*** LED must illuminate.

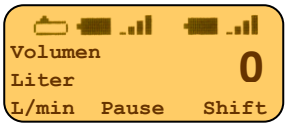
If the **<Start>** 1 Start key is pressed on the remote control or in MultiFlow ***without*** fill release from the **MC3(W)ASE**, the following status signals are possible:

- OP : `Not ready`
- OP : `Full`
- OP : `No communication`

☞ After a fill release is issued, the discharge can begin by pressing the **<Start>** 1 Start key.



Depending on the type of control used, MultiFlow can show the hose selection with the available hose paths. Using fully electric control, the "hose selection" is shown in MultiFlow with the last hose path selected. It may be necessary to select the hose path in MultiFlow with **<F1>** or **<F2>** and confirmed with the ***<Enter>*** Enter key.

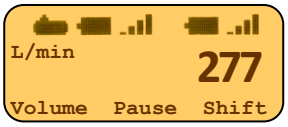


In the control type without hose path selection, the discharge starts immediately.

After MultiFlow registers the beginning of product flow, MultiControl displays its discharge screen.

7.3.4.1 Volume/flow rate display

By default, the volume discharged is shown.



By pressing **<F1>** F1 during a discharge, the current flow rate is shown. Pressing it again brings back the volume display (switching function).

7.3.4.2 Discharge start while changing a setup setting

If a discharge is started through MultiFlow while MultiControl is in the settings setup, MultiControl will leave the menu without saving and change to the discharge preset.

7.3.4.3 Engine speed adjustment only during the discharge

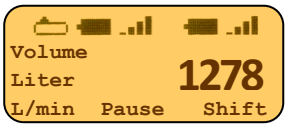
After the motor is started, engine speed adjustment is activated. Now the base station can set the engine speed with the vehicle's engine electronics. The engine speed is raised or lowered with the keys **<Set+>** 4 Set + and **<Set->** 6 Set - .

The engine speed adjustment can not exceed the preset parameters of the engine electronics.

see chapter 7.1.6 "Increased engine speed with “flow switch” (without MultiFlow) - 4 Set+ / 6 Set- " / page 42.

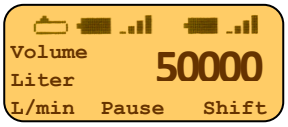
7.3.5 ⑤ Discharge end / pause

7.3.5.1 Pause (break) discharge



The discharge can be interrupted at any time by pressing **<Stop>** ***1x*** 3 Stop or ended by pressing **<Stop>** ***2x*** 3 Stop before the preset volume is reached.
“Pause” or ***“Stop”*** appears in the display, respectively.

- After pausing, the discharge can be restarted by pressing <***Start***> 1 Start on the remote control. (with the same preset)
- After pressing <***Stop***> 3 Stop twice, the discharge is irrevocably stopped and can not be restarted.

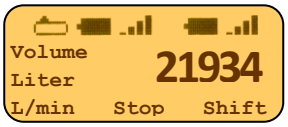


After reaching the preset volume the discharge is interrupted and ***“Pause”*** appears in the display.

- Pressing **<*Stop*>** 3 Stop irrevocably ends the discharge.

OR →

7.3.5.2 Discharge pause / end

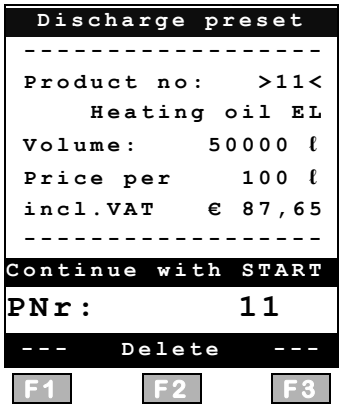


☺ The overfill protection activates. The symbol  ***"OFD WET"*** appears in the display and the status ***"Stop"*** is shown.

- Pressing <***Start***> 1 Start changes the status to ***"Pause"***.
- If the OFD sensor unlocks again, the discharge can be resumed with **<*Start*>** 1 Start .
- Pressing <***Stop***> 3 Stop irrevocably ends the discharge.

MultiControl's discharge screen is automatically left as soon as discharge end is signaled by MultiFlow.

7.3.5.2.1 Reenter preset



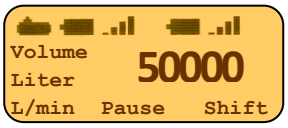
☞ If the discharge was interrupted, a new discharge can be entered on MultiFlow or via the remote control. The preset screen is shown as soon as an additional volume is enabled for an interrupted discharge in MultiFlow by pressing the **<F1>** F1 key.

7.3.5.2.2 Pausing by the OPU (MC3ASE/MC3WASE) in "Stand-Alone" operation

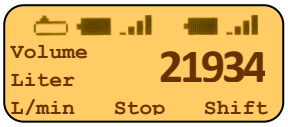
In this operational mode, MultiControl assumes the switching function for the OP solenoid valve („output 1", see terminal assignment). The switching characteristic depends on the parameter "AS valve control" in the vehicle setup setting.

☞ An additional solenoid valve regulates the discharge with[1)] the ***<Start>*** 1 Start and ***<Stop>*** 3 Stop keys.
To induce the discharge, the following steps must be followed:

- The OPU (**MC3(W)ASE)** is plugged into the connector of the tank to be filled. This puts the OFD sensor into operation and heats it. This is reported at the "**Sensor OK**" indicator.
- All steps for the beginning of the discharge must be completed at the flow meter.
- The discharge is started through[1)] the remote control with the ***<Start>*** 1 Start key.
- The discharge can be paused or stopped at the end of the discharge or as needed by pressing the ***<Stop>*** 3 Stop key[1)].



- After reaching the preset volume discharging is interrupted and ***"Pause"*** appears in the display.
- Pressing <***Stop***> 3 Stop irrevocably ends the discharge[1)].



If the discharge is interrupted by the OPU (**MC3(W)ASE**) because the maximum fill volume has been reached, the ***red*** LED "**OFD sensor WET**" will illuminate on the OPU (**MC3(W)ASE**) and corresponding information appears on the display of the remote control. The symbol ***"OFD WET"*** appears in the display.

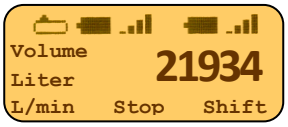
- If the OFD sensor unlocks again, the discharge can be resumed with ***<Start>*** 1 Start.
- Pressing <***Stop***> 3 Stop irrevocably ends the discharge.

The discharge must also be ended at the flow meter.

[1)] At "OP valve control" = Yes, Start/Stop
At "OP valve control" = Yes, Direct → the output is started directly from the OPU.

7.3.5.2.3 Pausing by the OPU in operation with MultiFlow

If the discharge is interrupted by the OPU because the maximum fill volume has been reached, the ***red*** LED "**OFD sensor WET**" will illuminate on the OPU and corresponding information appears on the display of the remote control.

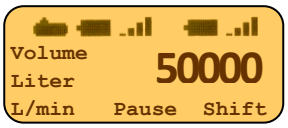


This information is transmitted to the base station and MultiFlow. The discharge will be interrupted by the OP solenoid valve or by MultiFlow within 2.5 seconds.

- The symbol  ***"OFD WET"*** appears in the display and the status ***"Stop"*** is shown.

- If the OFD sensor is only briefly dampened by foam, the discharge can be resumed by pressing the **<Start>**  key.

- The discharge can be paused or stopped at the end of the discharge or as needed by pressing the ***<Stop>***  key.

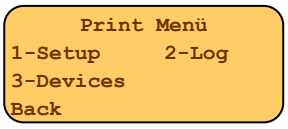


- After reaching the preset volume, discharging is interrupted and ***"Pause"*** appears in the display.
- Pressing <***Stop***>  irrevocably ends the discharge.

If the wireless connection to the base station is paused during discharging, then for safety reasons discharging will be stopped.

7.4 Printing

7.4.1 END - Print records with MultiFlow



The following information can be printed from the print menu :

- MultiControl setup
- Logbook by number or date
- Device info / Software versions of the individual devices
- Follow the directions on the display in each sub-menu.

A print job can be started via MultiControl. This is only possible when MultiFlow is in idle mode.

Due to differing system-dependent printer allocation times, there is no time out of the print job to MultiFlow on MultiControl's side. If the user wishes to cancel the print job, this must be done manually.

If there are (2) MultiFlows in the system, MultiControl selects MultiFlow 1 for printing.

7.5 Engine speed control

Engine speed control can take place in various ways:

- Pulse control
- Ramp control
- Resistance control

The connection from the base station to the motor management controller (MME) can vary according to vehicle manufacturer. The base station wiring for various vehicle manufacturers is shown in diagram **51.352291** / page 93 and **61.352292** / page 94.

It is only possible to change the engine speed with **<Set+>** or **<Set->** if the motor has already been previously started. When the motor is started, the engine speed begins at the idling value. No previous "**Set+/-**" settings are stored. The motor may be stopped at any time. The engine speed does not have to be reduced by pressing the **<Set->** key.

A change in the rotational speed is only possible while the motor is running. To achieve this, the motor can be started by actuating **<SHIFT>** + **<Start>** via the manual control unit. The MultiControl does not receive any feedback from the vehicle ECU about the motor started by using the ignition key. To be able to change the rotational speed in such cases as well, its base station must be notified once by pressing **<SHIFT>** + **<Start>** via the manual control panel.

In normal cases, the motor speed is lowered automatically to idle speed as soon as a delivery operation is stopped. A delay time can be specified using the parameter "Delayed rotating speed reduction" which is located in the Vehicle Setup. If the value is **>0s**, the automatic engine speed reduction does not commence until this specified delay has strted after a delivery interruption.

7.5.1 Pulse control (basic settings)

With pulse control, each pulse raises ***(SET+)*** or sinks ***(SET-)*** the engine speed by an amount set in the motor management electronics (MME).

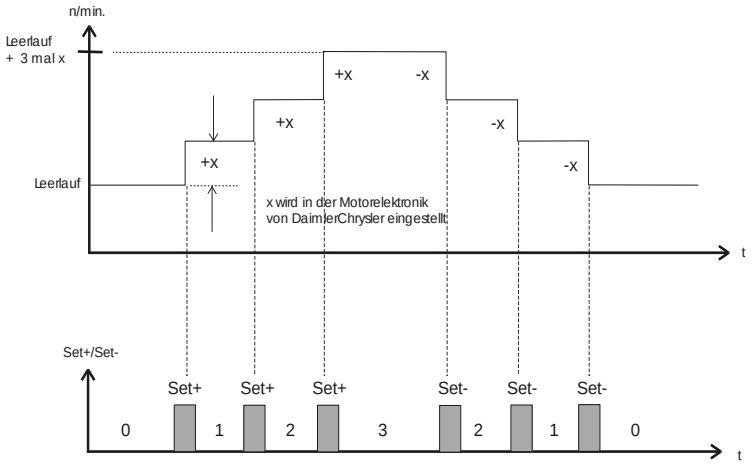


Fig. 11: Diagram of pulse control

If a value of 50 rpm per pulse is set in the motor management electronics (MME) and the current engine speed is 600 rpm, each pulse of ***SET+*** raises the engine speed first to 650 rpm, then to 700, etc. and with ***SET-*** back to 650 rpm and then 600.

So that MultiControl can operate correctly, the values set in the MME for the PTO must be applied to the MultiControl control. The value, which specifies how long a pulse must wait before is recognized as valid by the MME, is also important. Typical values for the pulse length are between 350 ms and 500 ms.

Example:

Values from the Motor Management Electronics (MME), which must be applied in the MultiControl Setup
see chapter 9 "Brief overview of menu structure" / page 67.

Min. pulse length:	350 ms
change / pulse	50 rpm
min. speed:	600 rpm
max. speed:	1000 rpm

Pulses from idle to maximum: 8

Calculation: $\frac{1000-600}{50}=8$

Optionally, MultiControl either sends a **single pulse**, i.e. a single pulse is sent for each key press of ***<SET+>*** or ***<SET->.***

Or a **pulse repetition**, i.e. pulses are sent as long as the keys ***<SET+>*** or ***<SET->*** are pressed.

- But only the number calculated by MultiControl in **"pulses from idle to maximum"**.

If a limitation in the pulses transmitted by the MultiControl can be waived, this can be configured in Vehicle Setup with the help of the "Unlimited pulse control" parameter.

- If this parameter is set to "**Yes**", MultiControl continues to transmit pulses for as long as one of the **<*SET*+>** and/or **<*SET*->** keys are being pressed.

7.5.2 Ramp control

With ramp control, engine speed is raised (***SET+***) or lowered (***SET-***) as long as the corresponding key is pressed.

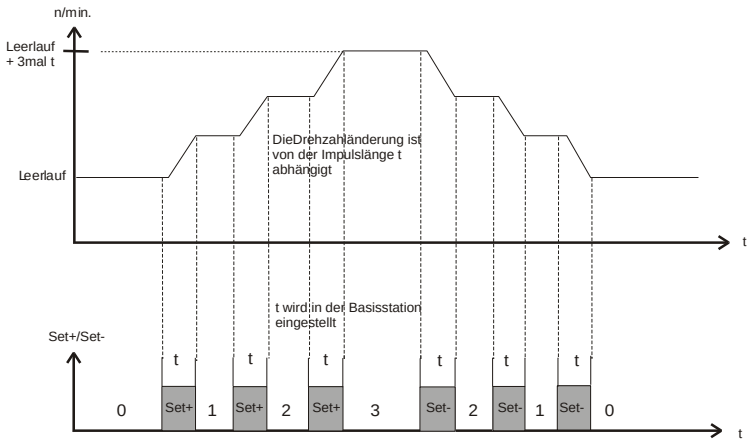


Abb. 12: Diagram of ramp control

A value must be set in the MME which states the grade. The grade defines the value by which the engine speed should be raised or lowered. If this value is set to 100 rpm per second, the engine speed will be raised by 100 rpm steps each second. If the current engine speed was 600 rpm and the **<*SET*+>** key was pressed for 4 seconds, then afterward the engine speed would be 1000 rpm.

This value must be selected carefully so that no damage is caused to the motor, gearbox and pump.

If the **<Set+>** / **<Set->** keys are pressed for a long time, the corresponding output is only active for the maximum **"*seconds from idle to maximum*"** calculated by MultiControl.

7.5.3 Resistance control (obsolete)

To use resistance control, the DIP switch **SW3** must be set according to see chapter 6.2.1 "DIP switch configuration" / page 32. Then, in principle, control works the same as with pulse control. However, in this case, for each pulse, resistances are switched parallel to a norm resistance (see also diagram **51.352291** / page 93).

7.6 Interconnecting the remote control and the OPU with the base station

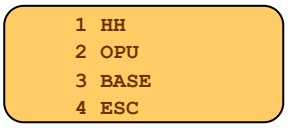
So that the individual MultiControl devices can communicate with one another, they must be interconnected in a wireless network and each must receive a common unique node number.

☞ **The base station receives a unique node number at the factory which corresponds to its serial number.**

Warning:
This node number may NOT be changed. In addition, this base station may only be assigned one OPU and one remote control to ensure safe operation and so that the MultiControl systems can't influence one another.

7.6.1 Selection of MultiControl devices

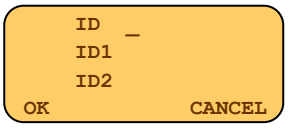
1. In order to interconnect the MultiControl devices, the keys **<7>** and **<8>** must be pressed simultaneously on the remote control. After approximately 5 seconds "***Password***" appears on the screen.
2. The password
   ▶ „***1234***" must be entered.



3. After successful entry, a selection of devices appears which can be interconnected:
   - HH (key **<1>**)
   - OPU (key **<2>**)
   - BASE (key **<3>**)
     (node number may ***N O T*** be changed !!)
   - ESC (key **<4>**)

☞ The corresponding device can be selected with the keys **<1>** and **<2>** and with **<4> = ESC** the operation is aborted. The key **<3>** = (BASE) is only implemented for F. A. Sening service personnel!

7.6.2 Interconnecting the remote control

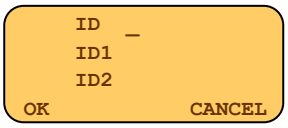


1. The current node number of the remote control must be entered in the line “**ID”** and confirmed with the key **<F1> = OK**. With new machines, the remote control has the node number **“1”**.

NOTE:
If the wrong node number is entered in the field **“ID”** it will not be accepted and the field remains empty.

2. The ***new*** node number, which corresponds to the node number (serial number) of the base station is now entered in the field “**ID1”** and confirmed with **<F1>**.
3. The ***new*** node number is repeated in the field “**ID2”** and confirmed with **<F1>**.
4. f the entry is correct, the remote control will permanently inherit the node number entered.
5. Pressing **<4>** = **ESC** leaves the menu.
6. If the interconnect was successful, the start screen as well as field strength and battery status will be shown on the remote control.

7.6.3 Interconnecting the OPU



This process is identical to that of the remote control.

1. The current node number of the OPU must be entered in the line "**ID"** and confirmed with the key **<F1> = OK**. With new machines, the OPU has the node number **"1"**.
2. The ***new*** node number, which corresponds to the node number (serial number) of the base station is now entered in the line "**ID1"** and confirmed with **<F1>**.
3. The ***new*** node number is repeated in the line "**ID2"** and confirmed with **<F1>**.

NOTE:
To confirm that the OPU has accepted the ***new*** node number, the ***green*** LED will flash briefly. Flash the LED **NOT**, this process must be repeated!

4. The OPU permanently inherits the node number entered.
5. Pressing **<4>** = **ESC** leaves the menu.
6. If the interconnect was successful, the start screen as well as field strength and battery status of the OPU will be shown on the remote control.

7.6.4 Configuration of the base station

This menu item is only implemented for F. A. Sening service personnel!

7.6.5 Note on node number allocation

The reallocation of wireless node numbers underlies high security measures. Interruptions of wireless transmission can cause the reallocation to not be carried out. In such cases, the reallocation must possibly be carried out as described in a different location.

If the node numbers used for the OPU or remote control are no longer available, both devices can be set back to a defined node number.

- In this case, download mode must be started on the device in question, as described in chapter . In order to prevent an unwanted update, the base station must continue to use the application software.
- As soon as download mode is started on the OPU or remote control, the node number of the affected device is automatically changed to **“1”**.
- To leave download mode, the device in question must be again be briefly connected to the charging station.
- Afterwards it can again be operated as usual. The node number can now be changed from the value **“1”** to the preset node number of the base station (= serial number).

In version < **1.10** (remote control) or **1.13** (OPU) is the node number, contrary to the previous node number is set to **"2"** back.

NOTE:
All devices of the MultiControl system must receive the same node number!

8 Software download

8.1 Manual software download for the hand-held control unit and the ASE

8.1.1 Download preparation

For the download, the base station needs a microcontroller with a special download software for hand-held control unit and ASE needed. If necessary, this will be provided by **F. A. Sening** Service.

8.1.2 Software Download → Hand-held control unit

1. Switch the base station ***OFF***.
   If the base station is mounted in a vehicle, make sure that the engine is off and the MultiFlow is located in the default display.

2. Open the cover on the base station.

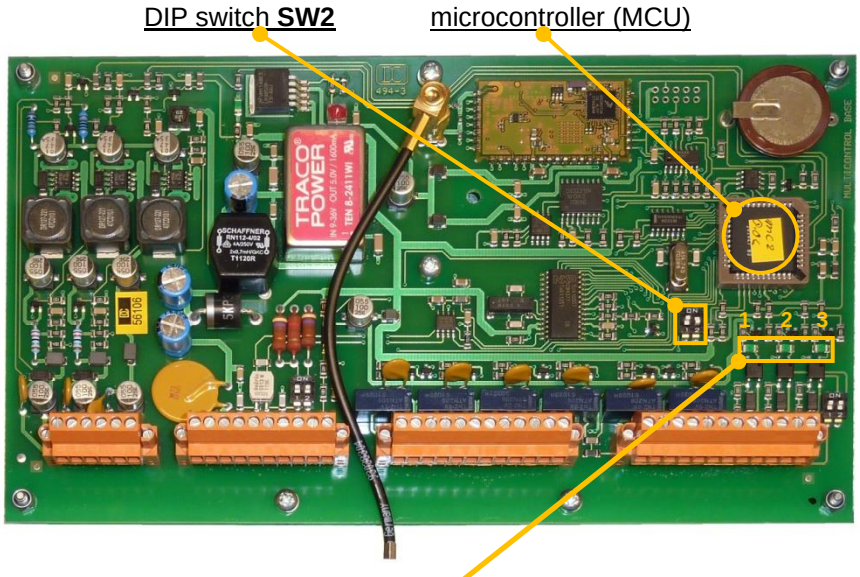
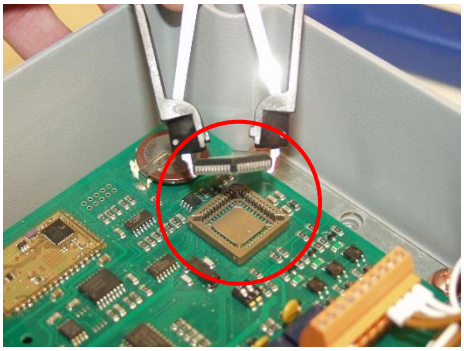
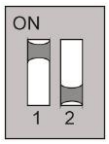


Fig. 13: MCU and LEDs on the base station PCB

3. Replace the microcontroller with an MCU with the download software!



- Use a special extraction tool for on the PLCC- and SOJ- sockets. The two hooks fit into the slots of the socket and reach under the component. Pressing on the pliers pulls the chip evenly and safely out of the socket.

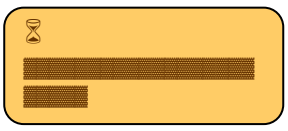


4. To download the hand-held control unit software, DIP switch **SW2** No. ***2*** must be in the ***OFF*** position!
5. Switch the base station back ***ON***.
   The base station indicates that it is ready to download when the ***green*** resistance control LED (**No.1**) is permanently lit.

6. Switch the hand-held control unit ***ON***.

7. Press the **<5>** button on the hand-held control unit and hold the button down.
8. Insert the hand-held control unit into the cradle **WHILE** holding down the **<5>** button as long as the backlighting is switched **ON.** It takes about **10s**.
9. As soon as the backlighting is switched **OFF**, release the **<5>** button.

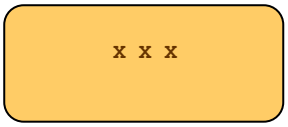
10. Now wait for the backlighting to switch back **ON** by itself, and again press button **<5>.**
11. Hold down the button until the backlighting switches **OFF**.
12. When the bootloader software required for the download is launched, the display on the hand-held control unit will show a progress indicator for a few seconds while the device prepares for the download.



13. The display on the hand-held control unit shows an hourglass ⌛ indicating that the device is ready for the download. As soon as the download begins, a progress indicator is displayed (which runs over two levels).
14. During the download, the ***green*** resistance control LED (**No. 1**) on the base station flashes at a 1s interval. Irregular flashing of the LED

indicates a wireless transmission error. A download may not be possible at the current location in this case.

15. The base station indicates the end of the download process with a constantly lit ***green*** "Set+" LED (**No. 2**).
16. When the download is complete, the hand-held control unit automatically switches **OFF**.



17. Switch the hand-held control unit back **ON**.
    The display briefly shows 3 "**X**".
18. Switch the base station **OFF.**
    If you do not need to perform any additional downloads, replace the microcontroller containing the download software with a microcontroller containing the latest software version for the base station.
19. Now switch **all** devices back **ON**.
20. The node number of the base station is not changed by a successful download.
21. After the download, the hand-held control unit automatically has a node number of **"1".**
22. Now set the same node number as the base station on the hand-held control unit. This is equivalent to the serial number of the base station. (see chapter 8.2 "Software replacement for the base station" / page 66)

If another download is necessary, repeat the process from point 6 onward.

If the download was successful and the correct node number has been assigned, the hand-held control unit will now start as usual.

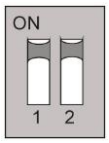
NOTE:
During the download, the node number of all devices involved is automatically set to ***"2"***. In hand-held unit versions < V1.10, an incomplete download can lead to the number of all nodes or individual involved devices remaining at the value ***"2"***. This should be considered when any problems occur during the re-allocation of the node number.

8.1.3 Software Download → ASE

1. Switch the base station ***OFF***.
   If the base station is mounted in a vehicle, make sure that the engine is off and that the MultiFlow is set to the standard display.

2. Open the cover on the base station.
   (see chapter 8.2 "Software replacement for the base station" / page 66)

3. Replace the microcontroller with an MCU with the download software!



4. To download the ASE software, DIP switch **SW2** No. ***2*** must be in ***ON*** position.

5. Switch the base station ***ON***. The base station indicates that it is ready to download when the ***green*** resistance control LED (**No.1**) is constantly lit.

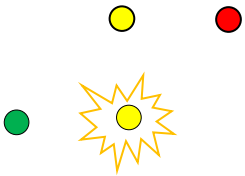
6. Switch the ASE **ON** and hold down the **ON/OFF** button. After a short time the ***yellow*** LED is lit. Keep holding down the **ON/OFF** button.

7. Now insert the ASE into the cradle **AND** keep holding down the **ON/OFF** button while the ***yellow*** LED is lit (for about **10** seconds).

8. As soon as the ***yellow*** LED is switched **OFF**, release the **ON/OFF** button.

9. Now wait until the ***yellow*** LED lights again by itself and press the **ON/OFF** button again.

10. Hold the button down again until the ***yellow*** LED goes **OFF**.
11. Then release the **ON/OFF** button.
12. After a few seconds only the yellow and red LEDs light up.
13. The ASE is now in programming mode. As soon as the download starts, the ***green*** LED will light up and the ***yellow*** LED on the ASE will flash at 1-second intervals.
14. During the download, the ***green*** resistance control LED (**No. 1**) on the base station flashes at a 1s interval. Irregular flashing of the LED on the ASE or base station indicates a wireless transmission error. A download may not be possible at the current location in this case.



15. The base station indicates the end of the download process with a constantly lit ***green*** "Set+" LED (**No. 2**).
16. When the download is finished, the ASE will switch **OFF**.
17. Switch the ASE back **ON**.
    The ***green*** LED lights up briefly.

18. Switch the base station **OFF.**
    If you do not need to perform any additional downloads, replace the microcontroller software (as in point 3) with the current software version for the base station.
19. Now switch **all** devices back **ON**.
20. The node number of the base station is not changed by a successful download.
21. After the download, the ASE automatically has a node number of **„1“.**
22. Using the hand-held control unit, set the ASE to the same node number as the base station. This is equivalent to the serial number of the base station.

☞ If another download is necessary, repeat the process from point 5 onward.

☞ If the download was successful and the correct node number has been assigned, the ASE will now start as usual. The hand-held control unit now displays the ASE symbols (battery, field strength).

NOTE:
During the download, the node number of all devices involved is automatically set to ***"2"***. In hand-held unit versions < V1.10, an incomplete download can lead to the number of all nodes or individual involved devices remaining at the value ***“2”***. This should be considered when any problems occur during the re-allocation of the node number.

8.2 Software replacement for the base station

If you only want to replace the base station software, you only need to replace the microcontroller in accordance with Section chapter 8.1 "Manual software download for the hand-held control unit and the ASE" / page 62. If you want to install new software on all the devices, first follow the procedure referred to in Section chapter 8 "Software download" / page 62. Following this you need to replace the microcontroller as described above.

9 Brief overview of menu structure

- The MultiControl menu can only be called up if the MultiControl is in idle mode and there is no communication between MultiControl and MultiFlow.
- If a discharge is started through MultiFlow while MultiControl is in the menu, MultiControl will leave the menu without saving and change to the preset screen.
- Changes to the vehicle setup can only be made with the engine off.

9.1 Main Menu Part 1

9.1.1 Setup Menu Part 1

Main-Menu	
1-Setup	2-Time
3-DeadMan	4-Logbook
Back	More

1-Setup
(part 1)

Setup-Menu	
1-System	2-Comp.
3-Network	4-Truck
Back	More

1.1-System

(display example)

Setup System Serial Number: 111111 Next Change	Setup System Serial Number: Set ←
Setup System Language: English Next Change	Setup System Sprache: English Set Next
Setup System Passwort: ****** Next Change	Setup System Password: 123456 Set ←
Setup System AUX behavior: switch Next Change	Setup System AUX behavior: button Set Next
Save Changes? YES NO	
	Setup not changeable! OK

1.2-Comp.

Setup Comp. No. Overfill Amp.: 1 **Next** **Change**	**Setup Comp.** No. Overfill Amp.: **Set** **(0-1)**
Save Changes? **YES** **NO**	
	Setup not changeable! **OK**

1.3-Network

Continue at →
MF 1

Setup Network MF 1 installed YES **Next** **Change**	**Setup Network** MF 1 installed YES **Set** **Next**
Setup Network MF 1 Node No. 1 **Weiter** **Change**	**Setup Netzw.** MF 1 Node No. 1 **Set** **(0-31)**
Setup Network MF 2 installed NO **Next** **Change**	**Setup Network** MF 2 installed NO **Set** **Next**

Continue at →
MF 2

Setup Network MF 2 Node No. 2 **Next** **Change**	**Setup Netzw.** MF 2 Node No. **Set** **(0-31)**
Setup Network MC3 Node No. 0 **Next** **Change**	**Setup Network** MC3 Node No. **Set** **(0-31)**
Save Changes? **YES** **NO**	
	Setup not changeable! **OK**

1.4- Truck

Setup Truck Overfill Valve Cont.: YES,Start/Stop **Next** **Change**	**Setup Truck** Overfill Valve Cont.: YES,Direct **Set** **Next**
Setup Truck Deadman Function: **No** **Next** **Change**	**Setup Truck** Deadman Function: **YES** **Set** **Next**
Setup Truck Speed Cont: Resistor NO **Next** **Change**	**Setup Truck** Speed Cont: Resistor YES **Set** **Next**
Setup Truck Speed Control Type: Pulse **Next** **Change**	**Setup Truck** Speed Control Type: Ramp Control **Set** **Next**

Continue at → **Pulse Control**	**Pulse Control** Min. Pulse Length: 350 msec **Next** **Change**	**Pulse Control** Min. Pulse Length: **Set** **(200-800)**
	Pulse Control Change per Pulse: 50 RPM **Next** **Change**	**Pulse Control** Change per Pulse: **Set** **(10-200)**
Continue at → activated pulse limit	**Pulse Control** Min. Speed: 600 RPM **Next** **Change**	**Pulse Control** Min. Speed: **Set** **(200-1000)**
Continue at → activated pulse limit	**Pulse Control** Max. Speed: 1000 RPM **Next** **Change**	**Pulse Control** Max. Speed: **Set** **(600-1500)**
	Pulse Control Delay Speed reduction 0 sek **Next** **Change**	**Pulse Control** Delay Speed reduction 0 sek **Set** **(0-60)**
Not applicable → for pulse. unlimited	**Pulse Control** Pulses from Idle to Max = 8 **Next**	
	Save Changes? **YES** **NO**	

Continue at → **Ramp Control**	**Ramp Control** Change per Second: 50 RPM **Next** **Change**	**Ramp Control** Change per Second: **Set** **(10-200)**
	Ramp Control Min. Speed: 600 RPM **Next** **Change**	**Ramp Control** Min. Speed: **Set** **(200-1000)**
	Ramp Control Max. Speed: 1000 RPM **Next** **Change**	**Ramp Control** Max. Speed: **Set** **(600-1500)**
	Ramp Control Seconds from Idle to Max = 8 **Next**	
	Save Changes? **YES** **NO**	
		Setup not changeable! **OK**

1-Setup (part 2)

Setup-Menu
5-Reset
Back **Mehr**

1.5-Reset

Setup Reset Factory Reset NO **Next** **Change**	**Setup Reset** Factory Reset YES **Set** **Next**
	Factory Reset not available! **OK**
Setup Reset All parameters set to default? NO **Next** **Change**	**Setup Reset** All parameters set to default? YES **Set** **Next**

2-Time

Date/Time Date: DD.MM.YYYY Time: HH:MM:SS **Back** **Change**	
Change ONLY possible WITHOUT MultFlow	**Date/Time** Enter Password: **Set** ←
	Enter Date Date: DD.MM.YYYY New Date: **Set** ←
	Enter Time Time: HH:MM:SS New Time: **Set** ←

3- Dead Man

Totmann-Funktion
NUR mit Umgehung!

Dead Man
Dead Man Override
YES
YES **NO**

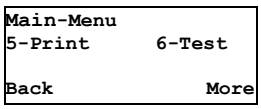
4- Logbook

LOG 1
01.01.2011 00:00
Logbook empty
Previous 1 **Next**

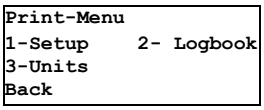
(Display example)

9.2 Main Menu Part 2

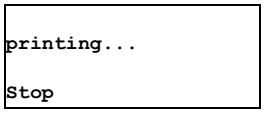
9.2.1 Setup-Menü



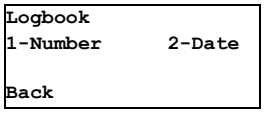
5- Print
(part 2)
(Only with MultiFlow!)



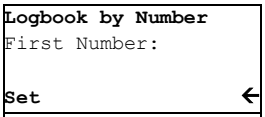
5.1-Setup



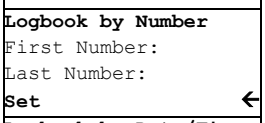
5.2- Logbook



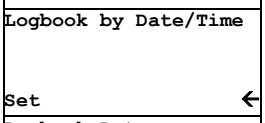
5.2.1-Nummer

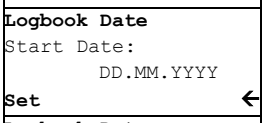


Enter value for next display!

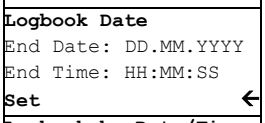


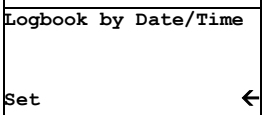
5.2.2-Date



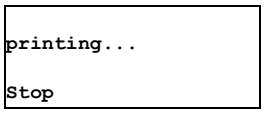


Enter value for next display!





5.3- Units



6-Test
(part 2)

```
Test-Menu
1-Base      2-
Overfill
3-Terminal
Back              More
```

6.1-Base

```
Basis node 21
Radio DVDI3301660
SW 1.04    FW 2.14
Back
```
(Display example)

6.2- Overfill

```
Overf. node 21
Radio DVDI3301660
SW 1.04    FW 2.14
Back
```
(Display example)

6.3-Terminal

```
Terminal node 21
Radio DVDI3301660
SW 1.04    FW 2.14
Back
```
(Display example)

10 Maintenance

The devices must not be modified mechanically or electronically in any way.

During cleaning with a steam cleaner or with pressurised water, the devices should be protected from the water jet. Never aim the steam jet directly onto the devices!

§ We cannot accept responsibility for any damage caused by moisture in the equipment as a result of improper cleaning procedures.

For all devices, a regular safety check in accordance with industrial safety regulations must be carried out. Equipment and protective systems which fall under the scope of Directive 94/9/EC and are operated in hazardous areas are also classified installations. It is the international standard EN60079-17 observed and there are other, country-specific policies, such as in Germany (Ordinance on Industrial Safety and Health) apply.

10.1 Maintenance plan

	daily	weekly	monthly	annually
Clean the outside of the device			**X**	
Visual testing	**X**			
Checking the LED `s				**X**
Examination of the case mounting for tight fit		**X**		
Check the cable and check function with GWG		**X**		

10.2 General

When cleaning with a steam cleaner or pressurized water, the device must be protected from the water jet. Never aim steam directly at the device!

§ If moisture is found in the devices, which can be traced back to improper cleaning work, the warrantee is voided.

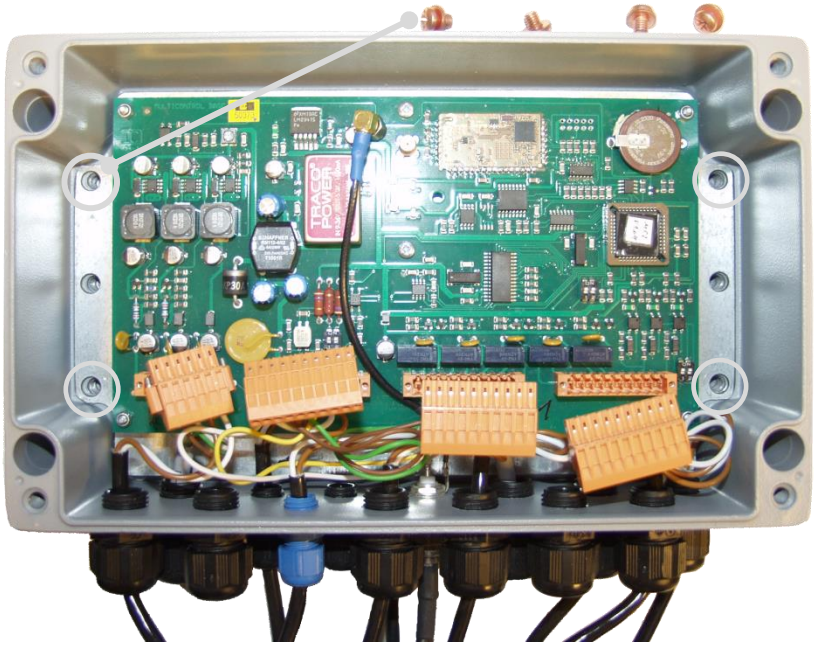
A regular safety check must be carried out for all devices.

If a MultiControl system device is replaced, the new device must be integrated into the existing wireless network, which consists of the base station, OPU and the remote control.

see chapter 7.6 "Interconnecting the remote control and the OPU with the base station" / page 58.

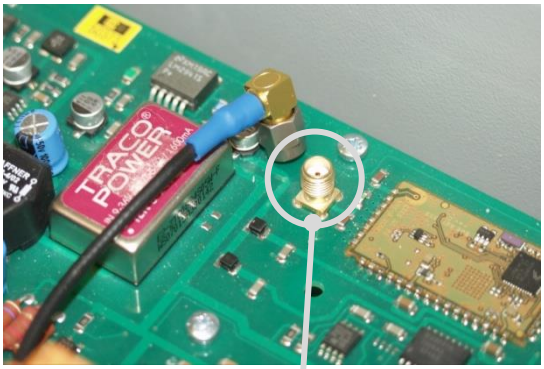
10.3 Replacing the base station circuit board (part no: 352282)

10.3.1 Loosen screws and plug



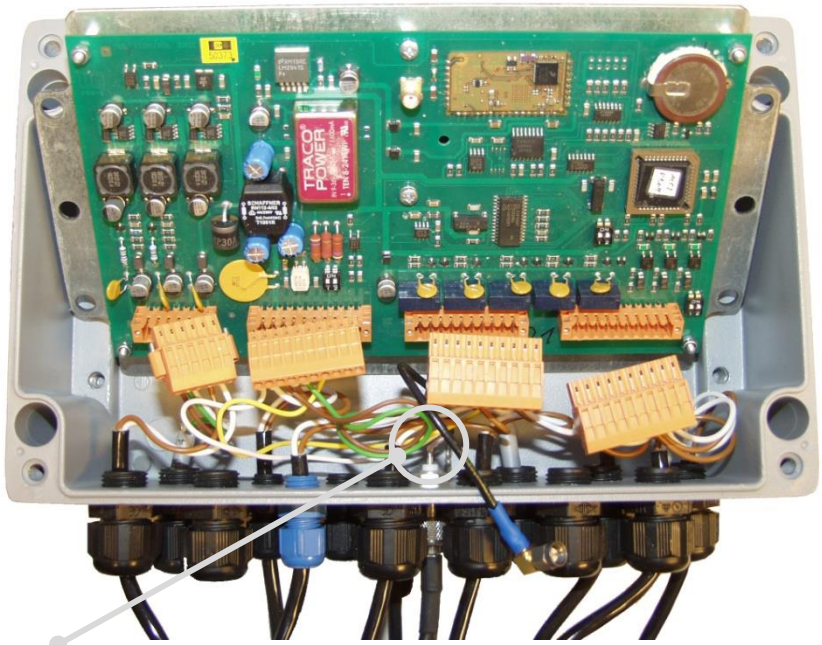
1. Turn the base station ***OFF***.
2. Open the lid of the base station.
3. Loosen the screws of the circuit board left and right (see the markings).
4. Before you can pull out the 4 plugs, first the locking screws to the left and right of the plug must be loosened. Then it can be pulled out.

10.3.2 Unscrew antenna's BNC plug



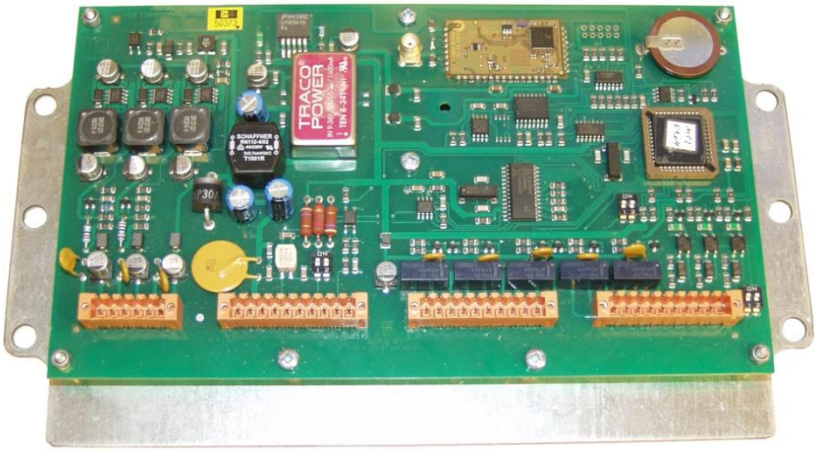
1. **Warning**:
   the antenna's BNC plug is not plugged in, but rather screwed on - see diagram!
2. First unscrew, then pull.

10.3.3 Take out the circuit board unit



1. Carefully bend the cable back.
2. Take special care not the pull out the BNC cable too far. The soldering point can be easily damaged! See marking.
3. Then pull the circuit board unit straight up, as shown.

10.3.4 Replace circuit board unit



1. Now the circuit board unit can be replaced.
   (Part no: 352282)
2. Reassemble in reverse order.

10.3.5 Change label and serial number

☞ With the replacement of the board for the base station, the Multi Control overfill prevention has a new serial number and node number. Thus, the old nameplate on the case must be exchanged with the enclosed new label and new serial number.

☞ Next, set with the hand control device, the new node numbers for **MC3(W)HH** and **MC3(W)ASE**.

10.4 Battery change MC3HH/MC3WHH

Necessary battery pack

- part no. 352323 (7,2 Volt, 1,0 Ah)
- Powerstrip large

battery pack

Powerstrip

Necessary tools

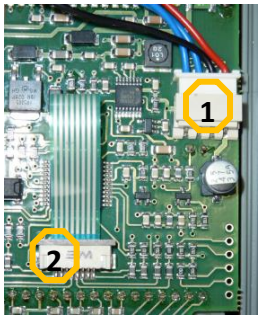
- Cross-tip screwdriver (magnetic)

Procedure

1 MC3(W)HH
Remove the 4 rubber caps, and remove the 4 screws.

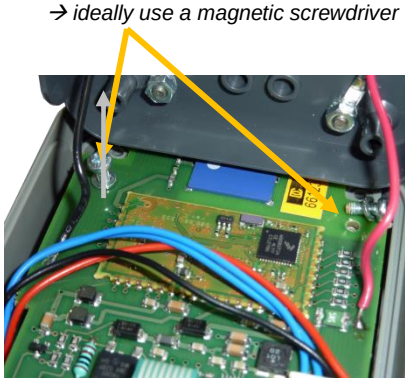
2 Carefully open the cover.

3 ***1.)*** Carefully remove the battery plug.



4 ***2.)*** Disconnect the ribbon cable by pushing the dark locking mechanism up and remove the cable.

5 Remove the two screws to remove the board.
→ *ideally use a magnetic screwdriver*



6 Carefully remove the mainboard and push the cable ribbon through the mainboard opening.

7 Open device --> Remove the battery pack and dispose of in due form.

Remove with care!
In older devices, the battery pack may be fixed very tightly !

8 Insert the new battery using the provided adhesive strips as shown.

9 Reassemble the MC3(W)HH, reversing the previous steps. Take care not to bend the flat ribbon cable in the process.

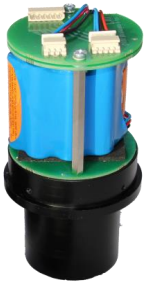
10 Fix the board with the two screws.
→ *ideally use magnetic screwdriver*

11 Function test after the reassembly of the MC3(W)HH. The display shows a battery symbol and the lettering „S E N I N G“.

10.5 Battery change MC3ASE/MC3WASE

Necessary battery pack

- Part no. P8000005635 (Bottom part, complete)



Necessary tools

- Cross-tip screwdriver

Procedure

1 **MC3(W)ASE**

2 Remove lower protection rubber-ring.

3 Remove the three screws with the cross-tip screwdriver.

4 Gently twist the lower part and carefully remove from device.

5 Disconnect from 6-pin plug the upper board group.

6 Completely remove bottom part.

7 Replace bottom part.
(Part no. P8000005635)

8 Connect the 6-pin plug to the upper board group.

9 Carefully push the lower part with a slight twist into the housing.

10 Align the bottom part and secure it with the three screws.

11 Mount lower protection ring.

11 Abstract from ElexV (§12)

Inspections

(1) The operator must arrange for the electrical devices to be inspected for the proper condition of their assembly, installation and operation by a qualified electrician or directed and supervised by a qualified electrician.

1. before first use

2. in specific time intervals.

The periods must be calculated so that resulting deficiencies, which must be assumed, are determined in a timely manner. The inspections according to sentence 1 no. 2 must be carried out every three years. They may be omitted if the electrical devices are constantly monitored by a responsible engineer.

(2) During the inspection, related standard engineering practices must be followed.

(**3)** If requested by the relevant authority, a test book with specific entries must be kept.

(4) In case of damage or in special cases, the regulating authority may arrange a special inspection by an expert. The operator must arrange that an assigned inspection, executed according to sentence 1, is carried out.

Abstract from Bundesarbeitsblatt 3/1997 page 101
(German Labor Bureau Sheet 3/1997)

12 Technical Data

12.1 Electrical specifications of the base station (MC3BASE/MC3WBASE)

Supply	24 V Nominal voltage (operable range from 15...30V) max. 35 W
Switching output	6 x Relay outputs 24V/500 mA 1 x Voltage output 12V/420mA 3 x Solid state outputs 24V/300mA
Antenna connection	TNC plug 50 Ohm, external antenna
Radio module	Output power: 500mW Sensitivity: -105dBm
Inputs	1 x 24V Digital input 1 x Open Collector input (20Hz to 100Hz)
Data circuit	1 x CAN-bus (termination selectable with DIP switch SW3) 100 KHz
Charging voltage for batteries	OPU: 19.5V / 420mA Remote control: 13.5V / 420mA
Protection type	IP65 for installation in the driver's cab
Operating temperature	-20 °C to 50 °C (-4 °F to 122 °F)

12.2 Electrical specifications of the OPU (MC3ASE/MC3WASE)

Supply	12V nominal voltage from internal battery less than 12 watts from the internal battery, battery charging takes place in a charging station in the vehicle
OFD circuit	Intrinsic safety protection type EEx ia IIB Maximum values : $U_o \leq 24.6V$, $I_o \leq 159.3$ mA, $P_o \leq 1.0$ W highest permissible external inductivity: $L_o \leq 4.4$ mH highest permissible external capacity: $C_o \leq 340$ nF
Antenna connection	External antenna
Radio module	Power output: 500mW Sensitivity: -105dBm
Protection type	IP54
Operating temperature	-20 °C to 50 °C (-4 °F to 122 °F)

12.3 Electrical specifications of the remote control (MC3HH/MC3WHH)

Supply	7.2V nominal voltage from internal battery
Keypad	14 keys (membrane keypad)
Display	Graphical LCD-4 lines with backlight
Antenna connection	External antenna
Radio module	Power output: 500mW Sensitivity: -105dBm
Protection type	IP54
Operating temperature	-20 °C to 50 °C (-4 °F to 122 °F)

13 Address and contact details

Our service department will be happy to assist and can be contacted as follows:

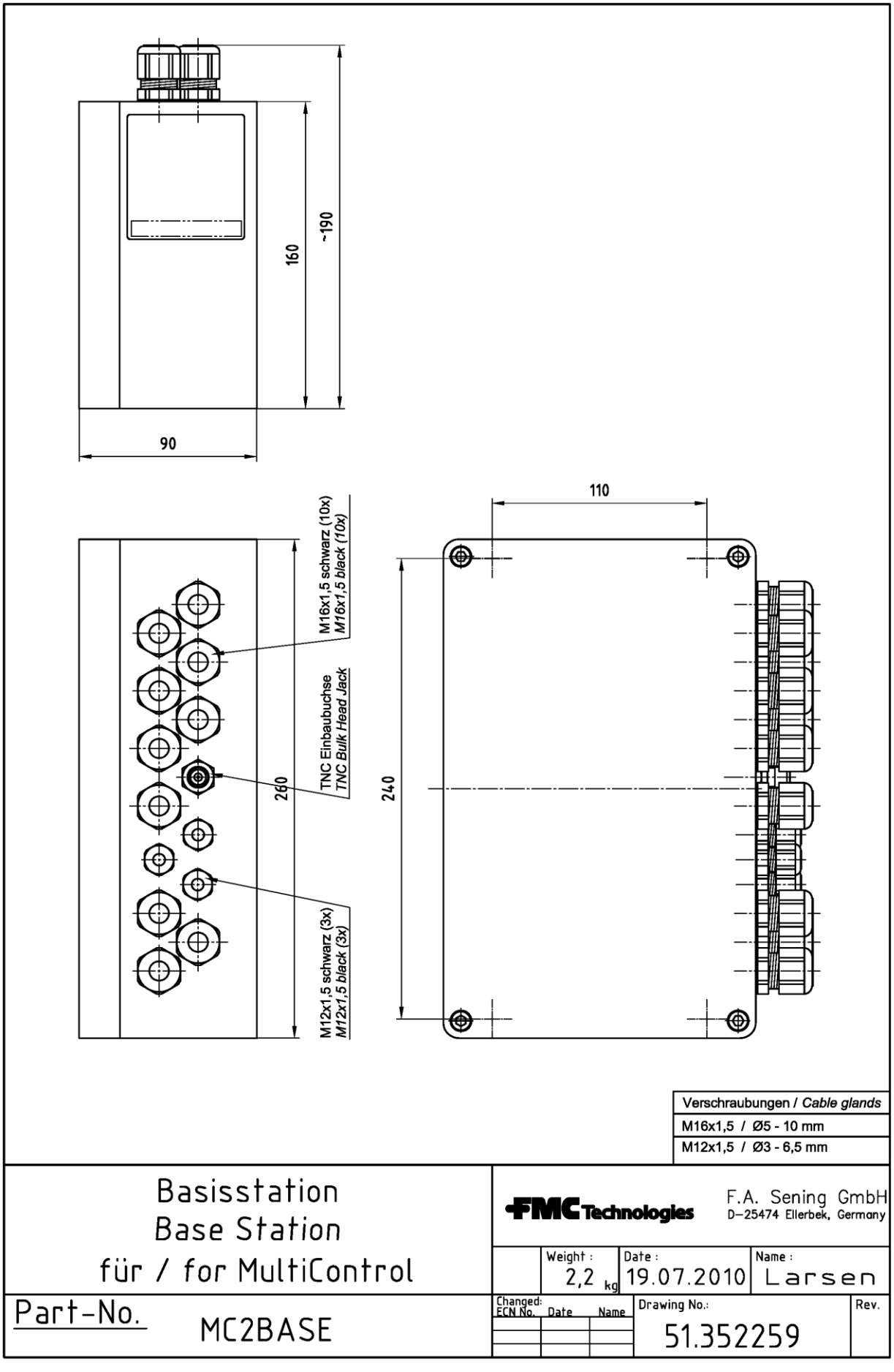
Guidant

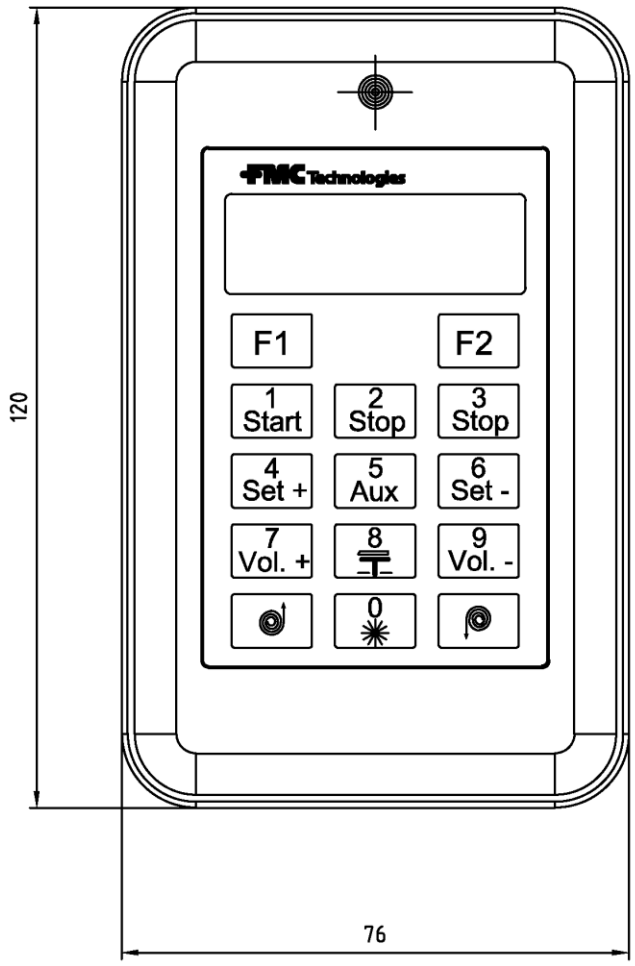
F. A. Sening GmbH
Regentstrasse 1
D-25474 Ellerbek

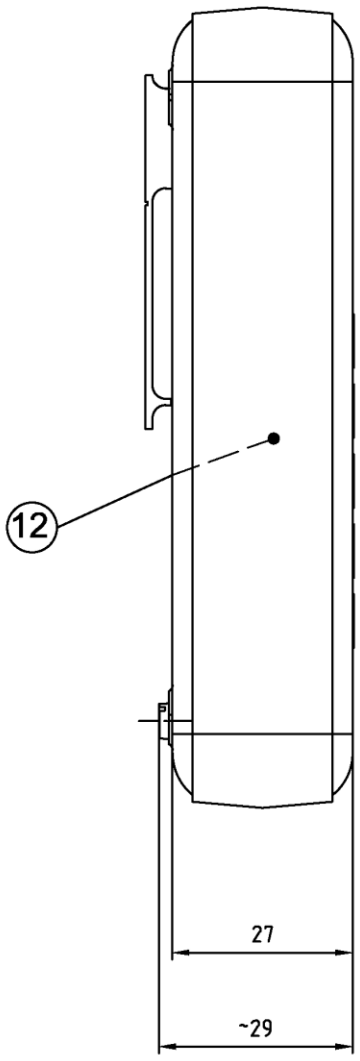
Tel.: +49 (0)4101 304 - 0 (Switchboard)
Fax: +49 (0)4101 304 - 152 (Service)
Fax: +49 (0)4101 304 - 133 (Sales)
Fax: +49 (0)4101 304 - 255 (Order processing)
Web: www.guidantmeasurement.com

Appendix A. Drawings and Approvals

Index


160
~190
90
M16x1,5 schwarz (10x)
M16x1,5 black (10x)
TNC Einbaubuchse
TNC Bulk Head Jack
260
M12x1,5 schwarz (3x)
M12x1,5 black (3x)
110
240
Verschraubungen / Cable glands
M16x1,5 / Ø5 - 10 mm
M12x1,5 / Ø3 - 6,5 mm
Basisstation
Base Station
für / for MultiControl
FMC Technologies
F.A. Sening GmbH
D-25474 Ellerbek, Germany
Weight : 2,2 kg
Date : 19.07.2010
Name : Larsen
Part-No. MC2BASE
Changed: ECN No. Date Name
Drawing No.: 51.352259
Rev.
"Schutzvermerk nach DIN ISO 16016 beachten"





Pos./ Item	Teile-Nr./ Part-No.	Stück/ Quant.	Benennung	Description
12	352323	1	Batteriepack	*Battery package*

ALL TOLERANCED DIMENSIONS ARE FOR INSTALLATION ONLY.
ALL OTHER DIMENSIONS ARE FOR REFERENCE ONLY.

FMC Technologies
F.A. Sening GmbH, Regentstr. 1, 25474 Ellerbek, Germany

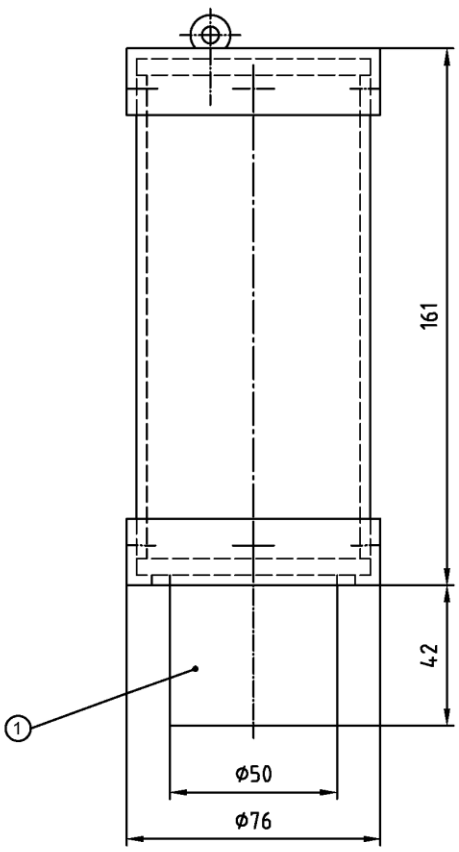
Method 1 | Method 3

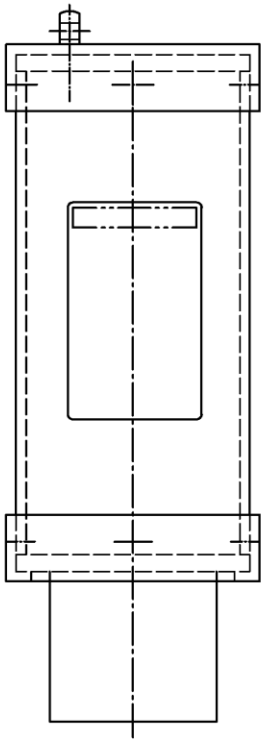
	Date / Datum	Name
Drawn	12.02.2013	Larsen
Checked	13.02.2013	Rehfeld

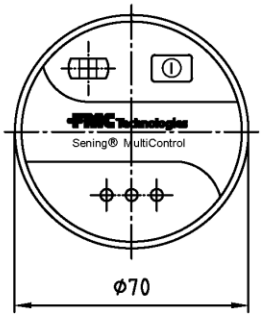
Item name / Benennung
MC2HH2 Handbediengeraet / Hand Held
made for / zugehörig zu
fuer MultiControl2

Scale / Maßst. 1:1	Item-No. / Teile-Nr.	Drawing No. / Zeichnungs-Nr. P8000005509	Rev. 000.00
Size / Format ISO - A4			Sheet / Blatt 1
Weight / Gewicht 0,2 kg			of / von 1

"Schutzvermerk nach DIN ISO 16016 beachten"







Werkstoffe:	Material:
verzinkter Stahl	zinc coated steel
POM	POM
NBR	NBR

Pos./ Item	Teile-Nr./ Part-No.	Stück/ Quant.	Benennung	Description
1	P8000005635	1	Unterteil,komplett / Akkupack	*Bottom part, complete / Battery pack*

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FMC Technologies
F.A. Sening GmbH, Regentstr. 1, 25474 Ellerbek, Germany

Method 1 | Method 3

	Date / Datum	Name
Drawn	02.11.2012	Larsen
Checked	05.11.2012	Arndt

Item name / Benennung
AS-Verstaerker / AS-Amplifier
made for / zugehörig zu
fuer MultiControl2

Scale / Maßst.	1:2
Size / Format	ISO - A4
Weight / Gewicht	1,0 kg

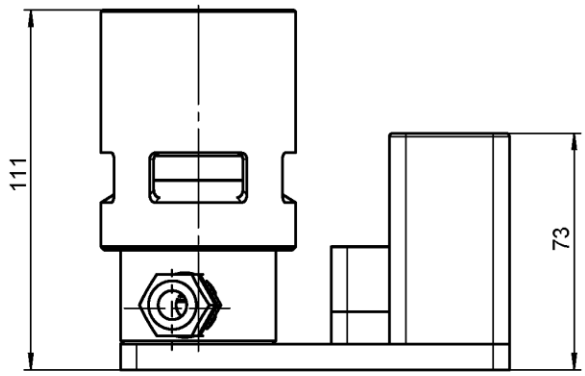
Item-No. / Teile-Nr.: MC2ASE2

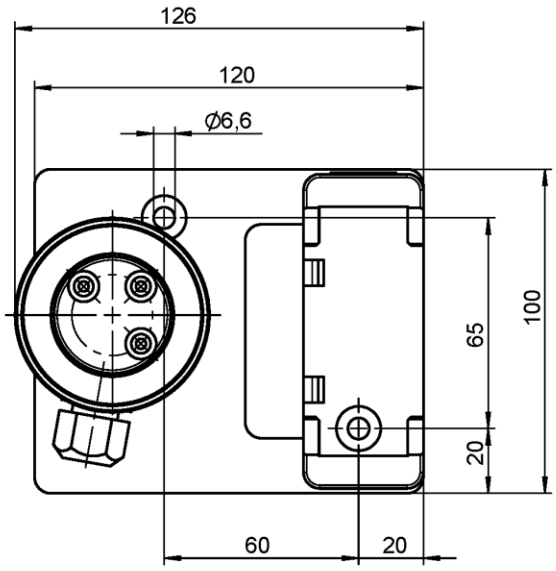
Drawing No. / Zeichnungs-Nr.: 352342_51

Rev.: 00A.00

Sheet / Blatt: 1 of / von 1

"Schutzvermerk nach DIN ISO 16016 beachten"

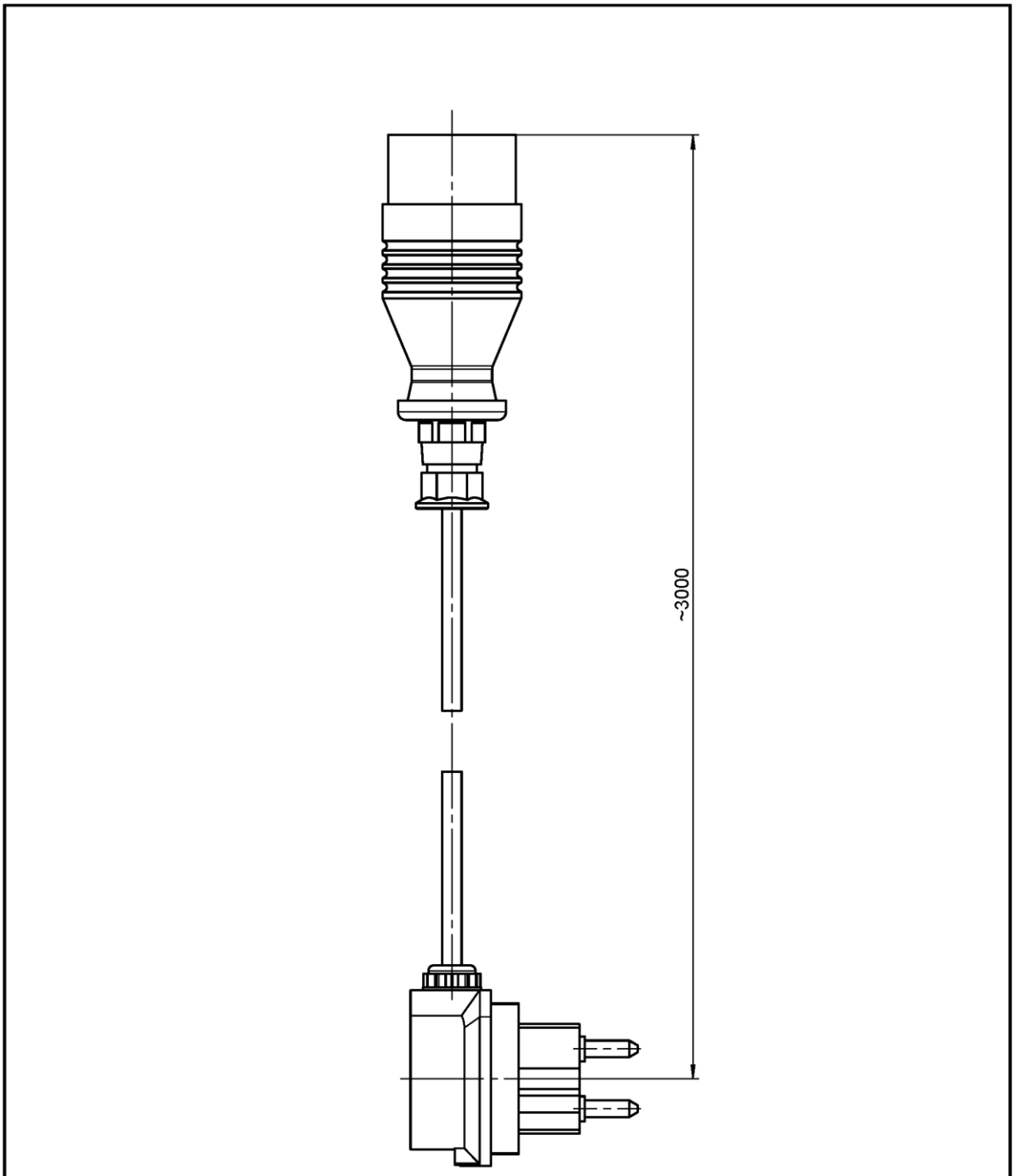




Werkstoffe:	*Material:*
Aluminium	*Aluminium*
verzinkter Stahl	*zinc coated steel*
POM	*POM*

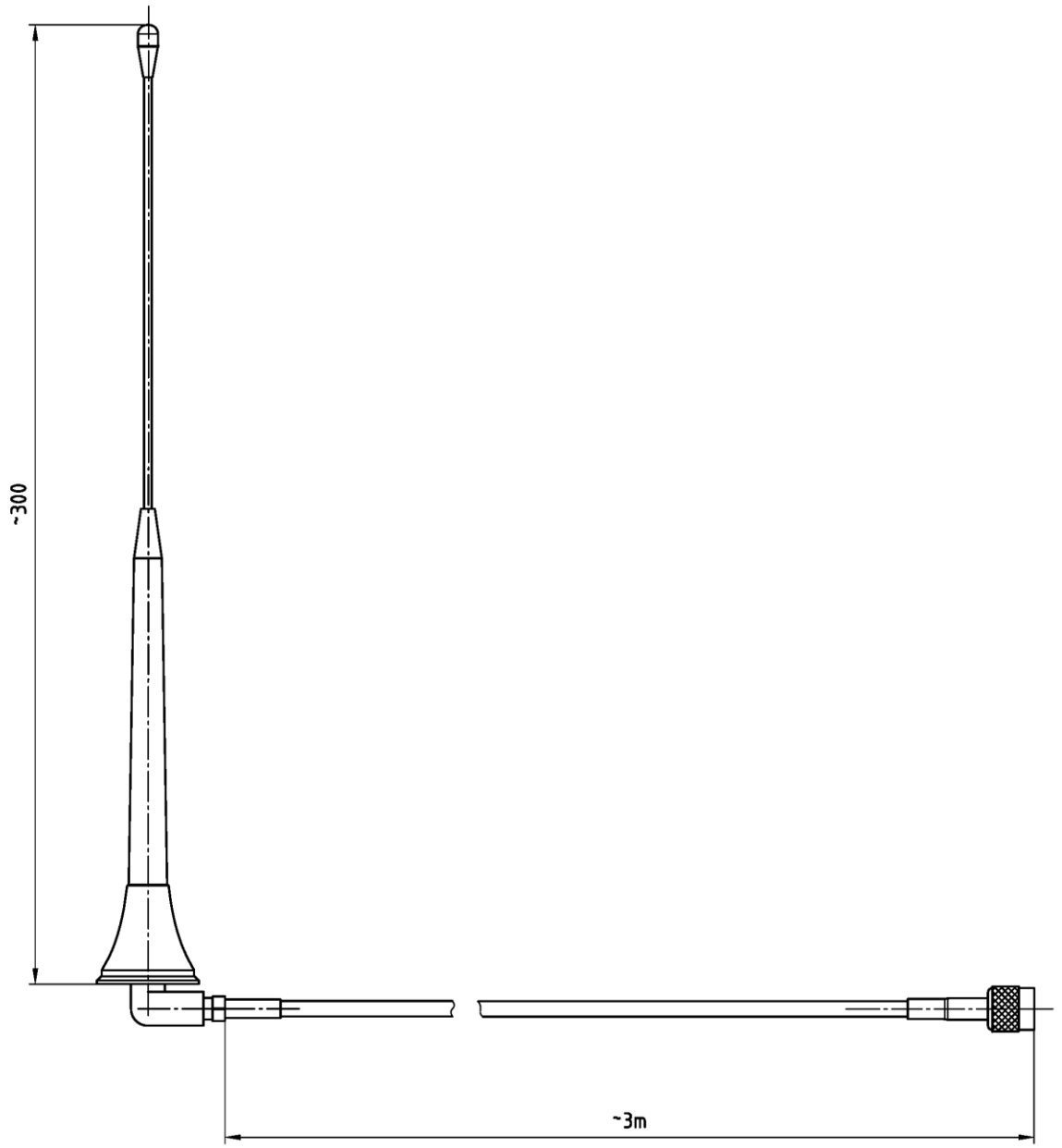
"Protective note according to DIN ISO 16016"

Ladegerät *Charge Cradle* für / *for* MultiControl	FMC Technologies	F.A. Sening GmbH D-25474 Ellerbek, Germany	
	Weight: 0,6 kg	Date: 15.07.2010	Name: Larsen
Part-No. MC2CHARGE	Changed: ECN No. / Date / Name	Drawing No.: 51.252496	Rev.:



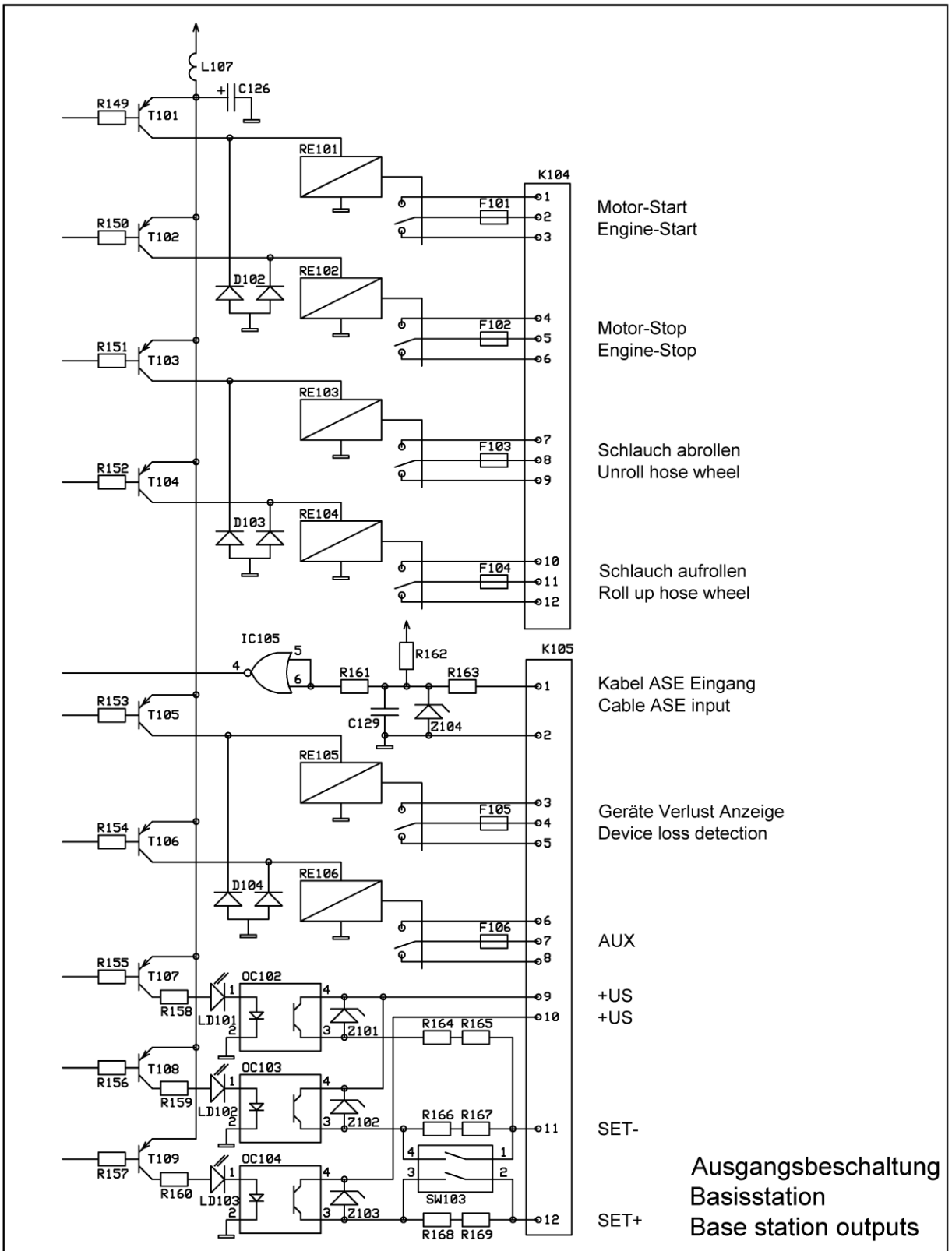
"Schutzvermerk nach DIN ISO 16016 beachten"

Verlängerungskabel *Extension cable* für / *for* MultiControl	FMC Technologies	F.A. Sening GmbH D-25474 Ellerbek, Germany	
	Gewicht: kg	Datum: 29.07.2010	Name: Larsen
Teile-Nr. MC2CABLE	Geand. am: / ECN Nr. / Datum / Name:	Zeichnungs-Nr: 51.352266	Rev.:



"Schutzvermerk nach DIN ISO 16016 beachten"

Antenne Antenna für / for MultiControl	FMC Technologies	F.A. Sening GmbH D-25474 Ellerbek, Germany	
	Weight : 0,3 kg	Date : 14.07.2010	Name : Larsen
Part-No. MC2ANTENNA	Changed: ECN No. / Date / Name	Drawing No.: 51.352253	Rev.



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FMC Technologies
F.A. Sening GmbH, Regentstr. 1, 25474 Ellerbek, Germany

	Date / Datum	Name
Drawn	19.10.2011	Larsen
Checked		

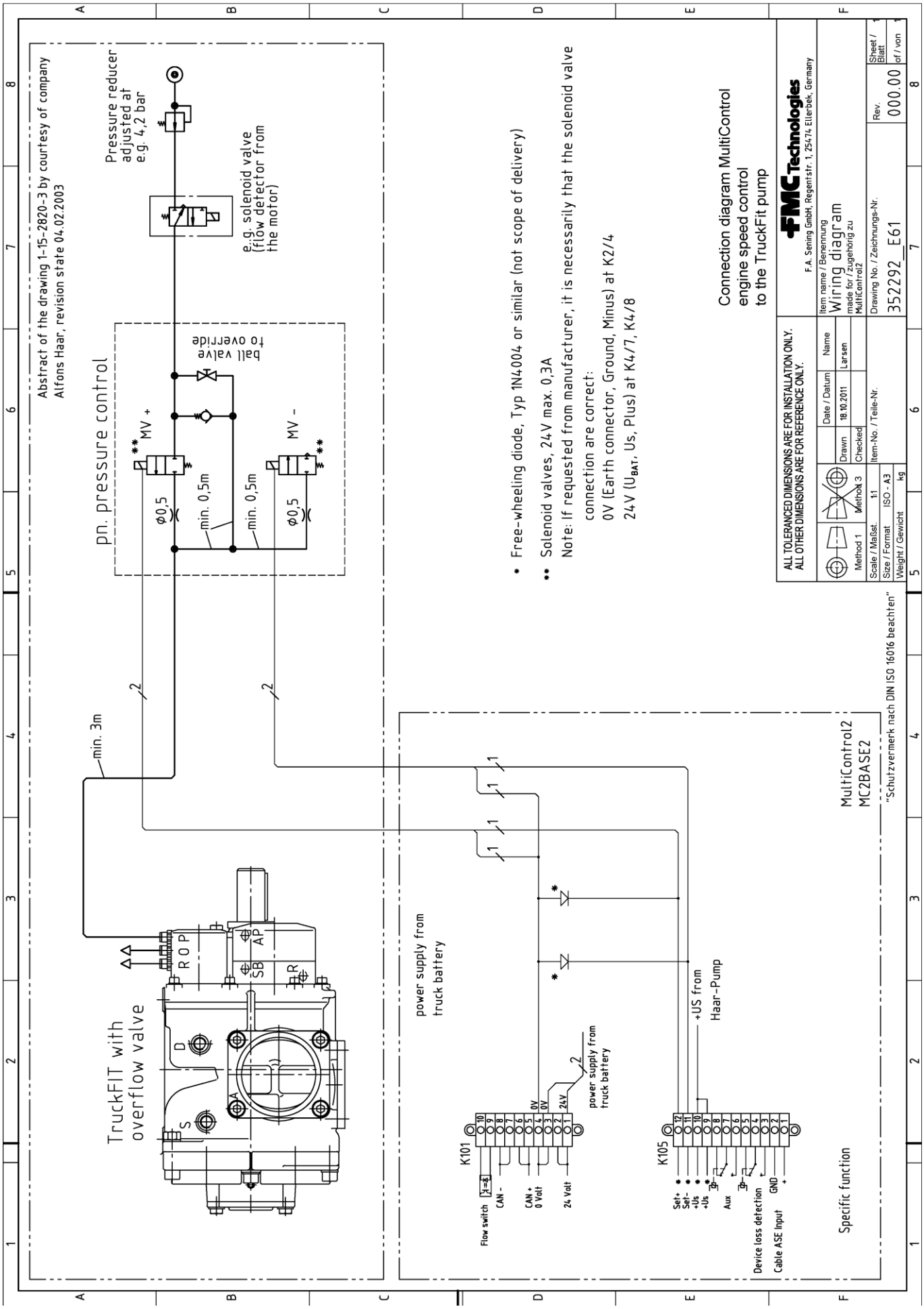
Method 1 Method 3

Item name / Benennung
MultiControl MC2BASE2
made for / zugehörig zu

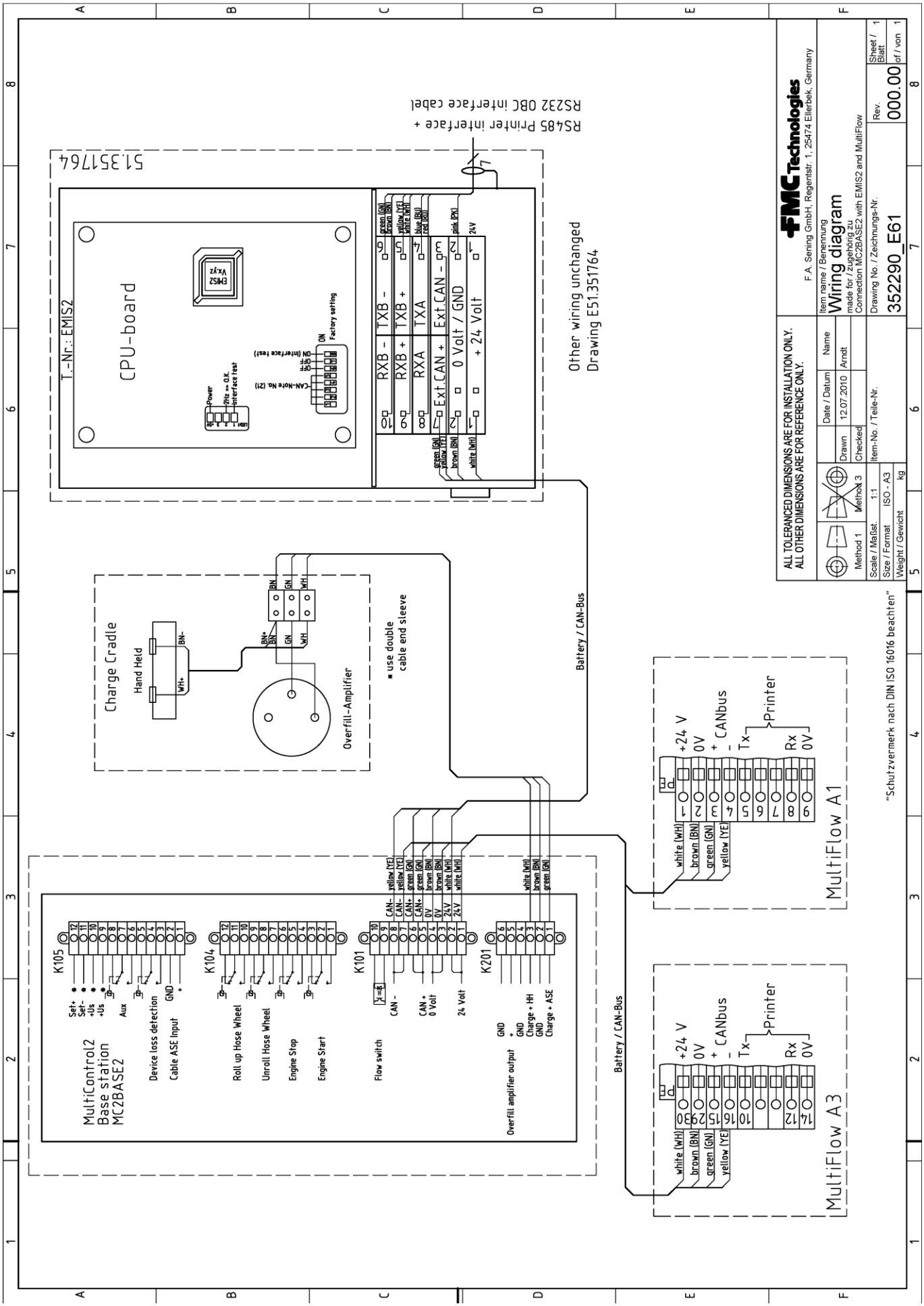
Scale / Maßst. 1:1	Item-No. / Teile-Nr.	Drawing No. / Zeichnungs-Nr. 352291_51	Rev. 000.00
Size / Format ISO - A4			Sheet / Blatt 1
Weight / Gewicht kg			of / von 1

"Schutzvermerk nach DIN ISO 16016 beachten"

E61.352292 - Connection diagram MultiControl engine speed control to the TruckFIT pump (MC2BASE2/MC3BASE/MC3WBASE)



E61.352290 - Wiring diagram Connection with EMIS2 and MultiFlow (MC2BASE2/MC3BASE/MC3WBASE)



Guidantmeasurement.com

Guidant
13460 Lockwood Road
Building S01
Houston, Texas 77044 USA

USA Operation
1602 Wagner Avenue
Erie, Pennsylvania 16510 USA
P:+1 814.898.5000

Germany Operation
Smith Meter GmbH | F.A. Sening GmbH
Regentstrasse 1
25474 Ellerbek, Germany
P:+49 4101 304.0

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