DITTEL M6000UP MARPOSS

DITTEL M6001UP MARPOSS

Installation, User and Programming Manual

Manual code No.:

D2DSM00XGF

MARPOSS

M6000 UP PB

M6000 UP PN

M6001 UP PB

M6001 UP PN

MANUFACTURER	MARPOSS S.p.A.
ADDRESS	Via Saliceto, 13 - Bentivoglio (BO) Italy www.marposs.com
MODEL	M6000 UP / M6001 UP
COVERS DSCC SOFTWARE	Version 3.74 or later
COVERS MODULE SOFTWARE	Version 2.0
FUNCTION	Balancing Module - electromechanical
MANUAL CODE	D2DSM00XGF
ISSUE	03/2024
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The information and descriptions contained in this manual are provided in good faith and **MARPOSS** declares that they are accurate at the date of publication. **MARPOSS** is not obliged to update the contents or to inform its customers of changes to the product.
The instructions contained in this document are intended for professional users who have a thorough working knowledge of the product in question.
Using the **MARPOSS** product for any purpose other than those described in this document, or carrying out any operation on it not described herein, shall invalidate any and all warranty agreements it may be covered by.
MARPOSS declines any responsibility for losses, damage or claims deriving from incorrect use of this manual. This manual, and all the information it contains, are protected under intellectual property rights legislation.

Original language Italian

CE	UKCA
This product conforms to the following directives: • 2014/30/EU EMC directive • 2011/65/UE RoHS & 2015/863/EU RoHS III The applicable standards are: • EN 61326 -1 (EMC) • EN 61010 - 1 (SAFETY) • EN IEC 63000 (RoHS)	This product conforms to the following UK regulations: • SI 2016/1091 The Electromagnetic Compatibility Regulations 2016 • SI 2012/3032 The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 The applicable standards are: • EN 61326 -1 (EMC) • EN 61010 - 1 (SAFETY) • EN IEC 63000 (RoHS)

About the directive "**ROHS**" regulating the presence of certain hazardous substances in electrical and electronic equipment: http://www.marposs.com/compliance_detail.php/eng/rohs

For information about possible use in Marposs products of materials coming from conflict areas, refer to:
http://www.marposs.com/compliance_detail.php/eng/conflict_minerals

INFORMATION FOR USERS

European Directive 2006/66/EC and United Kingdom regulations UK SI 2009/890 and UK SI 2008/2164
DISPOSAL OF EXHAUSTED REMOVABLE CELLS/BATTERIES

The crossed out wheelie-bin symbol printed on the battery, or its packaging, indicates that the cell or battery fall within the scope of the European Directive 2006/66/EC and UK regulations SI 2009/890 and SI 2008/2164, therefore it must be separated from the other waste products at the end of their working life. Correct waste separation and environmental disposal helps to prevent possible negative effects on the environment and human health and safety.
For Countries outside of the European Union and the United Kingdom (UK), collection and disposal must be carried out in compliance with the Standards in force or with other Laws of that Country regarding treatment of obsolete batteries.
For information about the type of used batteries and how to replace them without endangering the user, refer to the equipment instruction manual

INFORMATION FOR USERS

pursuant to the European Directive 2012/19/EU and UK Regulation SI 2013/3113 regarding waste from electrical and electronic equipment (RAEE-WEEE).

The crossed out wheelie bin symbol that appears on the product or its packaging indicates that the product must be disposed of separately from other waste materials at the end of its working life.

The manufacture shall be responsible for organizing and handling separate collection of the equipment described in this manual at the end of its working life. Users who wish to dispose of the equipment must contact the manufacture and follow the procedures implemented by the latter for the separate collection of the equipment at the end of its working life.

Sorting the equipment to be disposed of into its component materials before recycling, treatment and environmentally compatible disposal helps to prevent potentially harmful effects on health and the environment and favours re-use and/or recycling of these materials.

Illegal disposal of the product by the user is punishable by the application of fines or other penalties as defined by the applicable regulation.

CONTENTS

1 GENERAL WARNINGS

1.1 *Warnings for users*

This manual provides all the specific information necessary for knowledge and correct use of the Marposs M6000 UP or M6001 UP (from now called M600x UP) device in your possession. The buyer must ensure that all personnel assigned to install, operate and service the equipment read this manual. The information contained in this manual is intended for use by the following categories of personnel:

- Marposs personnel, or personnel assigned by the manufacturer of the machine tool that will house the M600x UP (hereafter the “Customer”), who will be directly responsible for installing the equipment.
- Technical personnel employed by the end user (hereafter the “User”) who will be directly responsible for operating the Marposs equipment.
- Technical Personnel assigned by the User to carry out maintenance work on the production line where the M600x UP is installed.

The manual is an integral part of the equipment, therefore the user must ensure that it is always available and is kept good condition throughout the working life of the equipment. The liability of Marposs is limited to correct use of the M600x UP as defined in this manual and its attachments. Marposs shall provide the customer with a copy of this manual and its attachments. Preparations that are the responsibility of the Customer.

- Switch OFF the machine tool when installing or adjusting components of the Process Monitoring System. Be sure the machine spindle has come to a standstill before working on it. Secure the machine against unauthorized or accidental switching on.
- NEVER use the rev counter of the M600x UP to check for standstill of the spindle! Even if the display shows “0” 1/min or the output at pin 24 of connector # 2 is 0 Volt, the actual speed may be between 0 and 72 rpm!
- Do not put any solid objects or liquids such as water into the unit. In case of an accident cut off the power supply.
- Using the unit with any object inside may cause fire or electric shock.
- Do not remove the cover. Refer servicing to qualified personnel only.
- Do not pull or bend the power cable and the signal cables. Replace damaged cables right away. Unused ports and connectors must remain covered with protecting ESD caps.
- Only personnel ordered and instructed by the management may operate the M600x UP.

The customer shall:

- Correctly position the M600x UP on its own machine and secure it.
- Make the electrical connections.
- Setup the M600x UP

The User shall:

- Program the M600x UP
- Perform the routine and extraordinary maintenance operations.

The safety of any system that incorporates this device and its accessories is the sole responsibility of the system assembler.

1.2 *Testing and guarantee*

Materials are guaranteed against defects, with the following limitations:

- DURATION OF THE WARRANTY: the warranty covers the product and all repairs carried out on it during the standard guarantee period.
- SUBJECT OF THE WARRANTY: the warranty applies to the product or its parts marked with the serial number or other identification systems used by Marposs.

The above guarantee applies unless other agreements are reached between Marposs and the Customer.

1.3 *Requesting technical assistance and maintenance*

In case of failures or faults that require the intervention of Marposs personnel contact your local technical support centre (for a complete list, go to: http://www.marposs.com/worldwide_addresses.php/eng).

1.4 *How to order spare parts*

To order spare parts contact your closest Marposs centre (see: http://www.marposs.com/worldwide_addresses.php/eng).

1.5 *Original version*

This document was originally written in Italian. In case of any dispute arising from translation errors and inaccuracies, even where carried out by Marposs, the definitive version shall be in Italian.

1.6 *Authorised and unauthorised use*

1.6.1 *Intended use*

- Use the M600x UP exclusively to balance machine spindles using electro-mechanically driven compensating weights.
- Operate the Module in industrial environment only.
- The device is suitable for indoor use only.
- The monitoring criteria of the spindle to be balanced, the “Raw Unbalance Signal” (equivalent to signal on connector # 2, pin 23, or PROFIBUS or PROFINET signal on connector # 13), may be used exclusively at a speed range between 300 RPM and 30,000 RPM.
- The monitoring criteria of the spindle to be balanced, the “Filtered Unbalance Signal” (equivalent to numeric display, display of coordinates and signal on connector # 2, pin 22, or PROFIBUS or PROFINET signal on connector # 13), may be used exclusively at a speed range between 300 RPM and 30,000 RPM.
- The settling time of the “Filtered Unbalance Signal” at speed changes between 0 RPM and 30,000 RPM can take up to 15 seconds. When the speed changes between 0 RPM and 6,000 RPM the settling time can take up to 8 seconds.
- Operate the M600x UP device only with original Marposs accessories.
- Do not operate the device in explosive areas. Operation of the M600x UP in such an environment means an essential endangering of safety.
- Unauthorized modifications and changes of the system are forbidden. When replacing defective parts use only original spare parts or standard parts recommended by the manufacturer.

1.6.2 *Unauthorised uses*

Under no circumstance may the M600x UP be used for any purpose other than that for which it was designed. Any use that differs from the use described in this manual shall be considered unauthorised.
The following are also prohibited:

1. Modification of the original M600x UP configuration;
2. Connection of the M600x UP to power supplies other than those described in this manual;
3. Use the components for purposes not envisaged by Marposs;
4. Allow unauthorised personnel to carry out maintenance work on the system;
5. Removal of safety indications and warnings displayed on the equipment.

All modifications or maintenance operations not covered by the technical documentation shall be considered arbitrary.
Marposs declines any responsibility for non-compliance with this requirement.

1.7 *Identification Labels and Pictograms*

Various different text formats were used when preparing this manual. Various safety warnings have been defined.

1.7.1 *Symbols used in the manual*

ATTENTION / WARNING
This type of note indicates a risk of damage to the electronic unit or other devices connected to it, or risk conditions for the operator or technician.

N.B.
Important information that may help the operator to use and understand the system is contained in boxes indicated by the letters “N.B.” in bold type.

ENVIRONMENTAL HAZARD
Recycle and/or dispose of in accordance with the applicable regulations in the destination Country.

CAUTION
Observe the procedures for handling devices that are sensitive to electro-static discharges. Failure to comply may cause malfunctions or damage the equipment.
For the M600x UP, this symbol is on the packaging of the I/O BOX (“3.6 Removing the M600x UP from its packaging” on page 16)

ELECTRIC SHOCK HAZARD
Dangerous voltages: There may be electric shock hazards when troubleshooting on live components.

GENERIC HAZARD
Warning sign that indicates the possibility of damage to things or a generic risk to people.
In the case of M600x UP, this symbol is associated with the rating IK, which means that the device has an impact protection level equivalent to 1 J, corresponding to a rating of IK06. If the glass is broken, use the appropriate safety gloves when handling the object and contact customer service in order to replace the equipment. The symbol is present both in the documentation and on the rear of the panel, in order to remind the user to consult the manual.

1.7.2 *Symbols present on the equipment*

Below there is a list of the pictograms on the device and referred to in the manual:

CAUTION
Observe the procedures for handling devices that are sensitive to electro-static discharges. Failure to comply may cause malfunctions or damage the equipment.
For the M600x UP, this symbol is on the packaging of the I/O BOX (“3.6 Removing the M600x UP from its packaging” on page 16)

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1.7.3 *Plates/markings on the M600x UP and components*

The identification plate is positioned on the lower part of the **M600x UP** device. The following information appears on the plate:

- The Marposs product identification CODE.
- The SERIAL N. of the individual **M600x UP** device.
- The CE mark.
- The UKCA mark.
- The MARPOSS Logo.
- The MADE IN ITALY mark.
- The MARPOSS QR code.

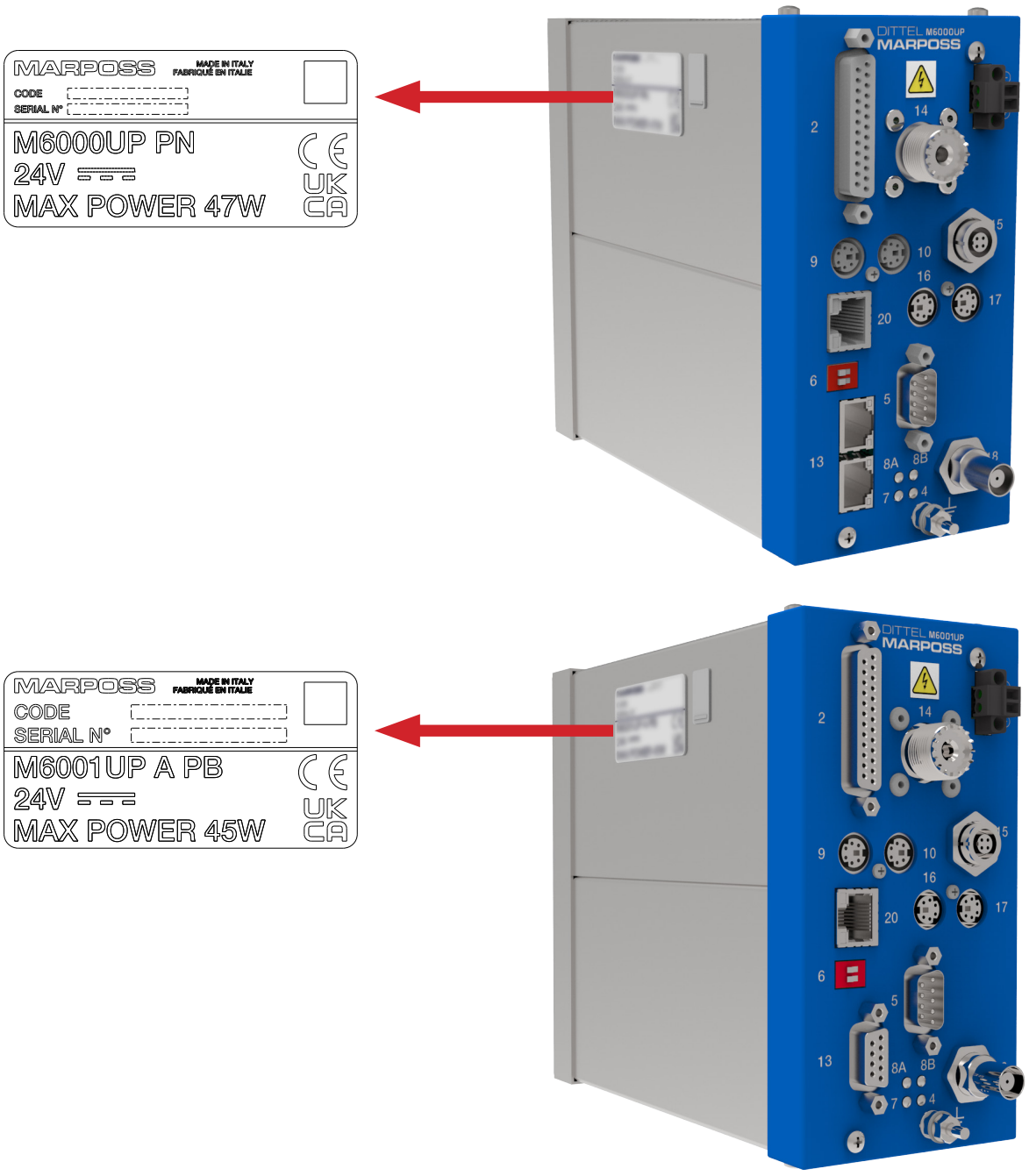


Fig.1. Examples of M600x UP Position of data plates

N.B.
All the data listed on the plate must always be legible.
If a data plate is damaged or even partially illegible due to wear, ask MARPOSS for another one, quoting the data in these instructions or on the original data plate.

2 SAFETY DEVICES

2.1 General safety information

2.1.1 Reference directives

The M600x UP has been designed and manufactured in accordance with the directives indicated on pages 2 and 3 of this manual.
The M600x UP must be managed by a machine tool used to machine mechanical parts, in compliance with the applicable safety standards for machinery equipment in the user's country.

2.1.2 Product conformity

The safety warnings are intended to prevent injuries to personnel and damage to both the M600x UP and the environment in which it is used. All operators are expected read the safety warnings, and respect them at all times.
The M600x UP is a state-of-the-art device that guarantees a high level of safety, provided all the appropriate safety measures are implemented during daily use.
The End User's responsibilities include defining such measures, and ensuring that they are implemented. Failure to observe the following instructions may result in serious injury as an indirect consequence of improper usage of the device. Device safety may only be guaranteed if the following instructions are adhered to.

WARNING
Any modification that alters the M600x UP design and/or build specifications may only be implemented by Marposs, who shall be responsible for certifying compliance with the safety standards.
Therefore the modifications or maintenance interventions not set out in this document shall be considered unauthorised.
Marposs declines all responsibility in case of any non-compliance with the above.

2.2 M600x UP User Categories and Duties

Installation technician: person qualified to install the M600x UP system inside the machine.
Duties:
1. lift, transport and store the M600x UP;
2. assemble and program the M600x UP;
3. remove the M600x UP.

Maintenance technician: person who is trained and qualified to carry out routine and extraordinary maintenance work on the M600x UP.
Duties:
1. routine maintenance;
2. extraordinary maintenance;
3. Notify Marposs customer service personnel of unexpected situations (e.g. wear, failures, breakages, errors, etc.) not set out in this document and therefore generated by unforeseen causes.

Operator: person assigned to activate the measurement acquisition cycle and monitor the correct operation of the M600x UP.
Duties:
1. Monitor the process
2. Modify the programmed parameters via the control panel, when necessary.

The operator is not required to intervene in any way while the M600x UP is operating.

2.2.1 Physical and mental health of the operator/installation personnel

The operator assigned to install the M600x UP must be aware of the dangers that may be created while installing machining equipment, and be capable of dealing with them.

2.3 *Training*

THE FINAL MACHINE DOCUMENTATION MUST BE READ
The training of operators assigned to normal operation must follow the instructions set out in the documentation of the final machine that the M600x UP is installed in, as this documentation cannot be exhaustive.

Personnel included in the following categories are obliged to read the manual supplied with the equipment.

Installation technicians personnel assigned to transport, store and install the gauge, in order to:
- Ensure they are aware of the appropriate lifting and transport methods used for the parts of the M600x UP, as stipulated by Marposs, in order to prevent the risks associated with moving loads;
- Ensure they are aware of the correct storage procedures for the parts of the M600x UP in order to avoid damaging important parts, not only in terms of safety but also from an operational point of view;
- Ensure they are aware of the correct M600x UP installation procedures, such as wiring the electrical parts, in order to prevent assembly errors that could lead to dangerous situations for the health and safety of the operators.

Operators assigned to supervise normal operation of the equipment, in order to:
- Ensure they adhere to the applicable regulations governing use of the equipment, and that they read and following the instructions and other information provided in the attached documentation.

M600x UP maintenance technicians, in order to:
- Ensure they are aware of the correct procedures for carrying out scheduled and unscheduled maintenances activities on the M600x UP.

2.4 *Electrical Dangers*

Every effort has been made to adopt all the necessary safety and protection measures during the design phase, however some electrical dangers remain. These risks are listed below.

ELECTRICAL PARTS
The system is energized by an electrical power supply. Personnel may be exposed to the risk of electric shocks in the event of electrical faults or when working on electrical parts. Ensure that all electrical work is carried out exclusively by qualified personnel.
Display the appropriate warning signs. After deactivating the machine, and before starting working on its electrical parts, make sure that the control panel or system controls are not connected to the electrical power supply.

Moreover, it is important to remember that:
Incorrect actions by the operator can cause residual risks.
The risks and dangers generated by:
- Operator carelessness,
- Failure to comply with the information and instructions contained in these operating instructions,
- Deliberate tampering with the M600x UP or its safety devices.

Any modification that alters the M600x UP build specifications, whether mechanical or electrical, can only be performed by Marposs, which will certify compliance with the safety standards. Any modification or maintenance not indicated in this document shall be considered unauthorised.
Marposs declines all responsibility in case of any non-compliance with the above.

3 TRANSPORTATION. STORAGE

3.1 Personal protection equipment (PPE)

The operators assigned to transportation, storage and installation of the M600x UP must obtain and use the PPE indicated in this manual, as well as the mandatory PPE for the environment in which the M600x UP is used.

3.2 Training

The operators assigned to transportation, storage and installation of the M600x UP must be trained and informed as required by the applicable directives in the relative countries.

3.3 State of tools and equipment

The operators must use the equipment listed in the corresponding paragraphs when carrying out transportation, storage and installation operations.
It is important to ensure that the equipment and tools are in good condition and that they are not worn, excessively aged or fatigued in any way.
The tools must be selected in accordance with the applicable laws and regulations governing working tools and must be used in accordance with the manufacturers' instructions.

3.4 Taking delivery of the material

During packing, all the M600x UP technical material is thoroughly checked in order to ensure that no damaged material is shipped.
When unpacking the material, check that the M600x UP is in perfect condition and not damaged in any way. Notify Marposs immediately if it is damaged.

3.5 Packaging, handling, transport

3.5.1 Packaging

The M600x UP is protected with carton and an internal insert for handling and transportation.

3.5.2 Handling the package

No specific equipment is required for handling the package.

3.5.3 Transporting the package

The package containing the M600x UP must be transported on covered transport vehicles so that it and the M600x UP are not exposed to the weather.

3.5.4 Disposing of packaging materials

The packaging used for the M600x UP consists of materials that can be disposed of without exposing people, animals or property to any significant hazards.

Operators or personnel responsible for disposing of the packaging should be aware that it consists of:
- Cardboard: external container and internal insert
- Polyurethane film: internal insert.

ENVIRONMENTAL HAZARD
The polyurethane film is NOT biodegradable. It must NOT be disposed of in the surrounding environment: recycle and/or dispose of materials in accordance with local regulations.

3.6 *Removing the M600x UP from its packaging*

Marposs has not indicated special devices for removing the M600x UP from the packaging.

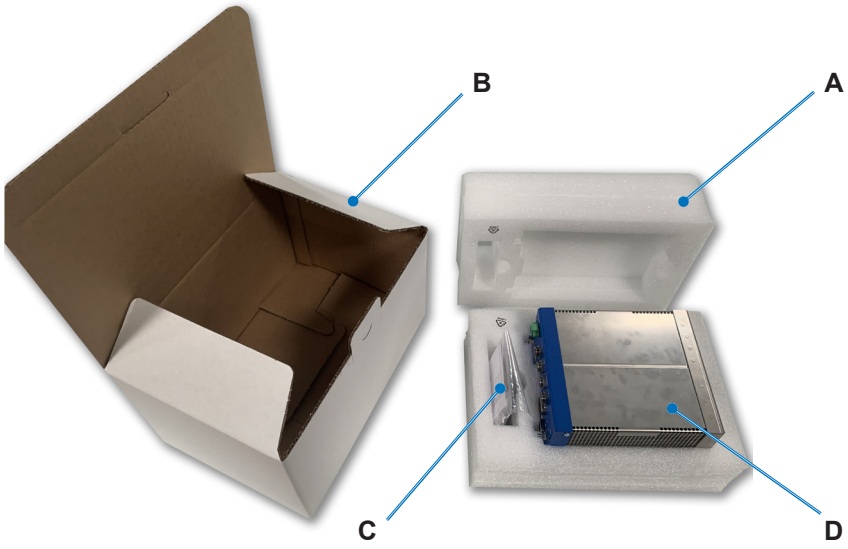


Fig.2. M600x UP packaging

- Remove the M600x UP packaging (A) from the box (B)
- Remove from the packaging the CDs (C) containing the manuals (to be kept)
- Finally, remove the connector and the M600x UP (D) from the packaging.

4 ENVIRONMENTAL CONDITIONS

The mechanical and electronic components installed in the M600x UP have been selected for their reliability and durability. The components meet the manufacturing safety requirements in force and have been designed to withstand temperatures from -20 °C to +70 °C (from -4 °F to 158 °F) during transport and storage.

4.1 *M600x UP Storage Environment*

The M600x UP must be stored in a covered area where dust and humidity levels are kept to a minimum.
The warehouse storage shelf must be level and smooth.
Do not rest other materials, even light items, on top of the M600x UP package or the M600x UP itself, as this may damage it.

4.2 *M600x UP Working Environment*

When installing the unit, the operator must check that the final machine has been designed and built to operate in the environmental conditions set out below.

TYPE OF ENVIRONMENT:

The M600x UP and the relative electrical components have been designed and built to be installed in a heavy industrial environment, and to be used only in closed environments where they are protected from the weather. Do not use the equipment in residential or light industrial environments.
Atmosphere must be free of conductive substances, corrosive gases, vapours, oily mist, and dripping water. In addition, avoid salty air, as well as localities where condensation can appear by temperature variation.
The M600x UP is intended to be installed in control cubicles. Mounting hardware is available for installation on vertical surfaces, either a mounting panel or a clamping device for DIN mounting rails.
Unless otherwise specified in the contract, the M600x UP can only operate regularly in the environmental conditions set out below. Environmental conditions other than those described may damage the machine or cause it to malfunction, giving rise to potential hazardous situations for the operator and exposed personnel.

AMBIENT AIR TEMPERATURE

The M600x UP components will operate correctly at temperatures: +0 ÷ +50 °C (32 to 122 °F). No direct sunlight.

OPERATING RELATIVE HUMIDITY

Relative humidity when in use: 20% ÷ 80%.

ENVIRONMENTAL POLLUTION GRADE

Grade 2

ALTITUDE

The electrical components are designed to operate correctly: 0 ÷ 2,000 m / 0 ÷ 6,600 ft.

POLLUTANTS

The electrical components are adequately protected against the infiltration of solid bodies when using the M600x UP for the intended purposes and in the specified operating environment.
Unless otherwise stated in the contract, the electrical components DO NOT have specific protections against contaminating agents such as dust, liquids, acids, corrosive gases, salt, etc.
If it is necessary to use the electrical components and the complete equipment in environments subject to such contaminating agents contact Marposs immediately. Marposs will check the suitability of the assembly based on the environments they are used in.

“NORMAL” ENVIRONMENTAL LIGHTING

The installation procedure must be carried out under “normal” lighting conditions, i.e. without dazzling the operators with too much light or causing them to strain their eyes in insufficient lighting.
The personnel responsible for installing the M600x UP must comply with the minimum requirements set out by the applicable laws in the respective countries in terms of natural and artificial lighting of the premises.
If there is poor lighting in the workplace the operator must use portable lighting equipment.

5 GENERAL DESCRIPTION OF THE SYSTEM

The M600x UP has been designed and built as an a state-of-the-art Electromechanical Balancing Module developed and produced according to recognised safety directives, rules, standards, and regulations. Primarily developed for use on high precision grinding machines, the M600x UP enables detection, evaluation, and monitoring of unbalance. Fast and precise compensation is performed by an external or internal non-contact Balancing System - containing electromechanical adjustable compensating weights - fully automatic and at operating speed.
All settings, display and operation of the M600x UP are exclusively carried out on a PC integrated Automation System for machine tools or a standard PC based on Microsoft Windows®. Predefined, individual adjustable user levels are provided like Service / Administrator / Expert / Operator / Observer. The display window can be specified individually as well with regard to graphic representation, or window width.
By additional balancing modules, it is possible to supervise and to balance many machine spindles at the same time; complicated switching-over is dropped. Carried out just as simple is the extension for process monitoring by one or more Acoustic Emission (AE) module(s) AE6000. The total number of all modules and control units (PC, Automation System) is restricted to 15.
A serial and parallel interface as well as a PROFIBUS interface are available. There are also variants with PROFINET instead of PROFIBUS. An overview can be found in the following table.

Variants	RS232	ETHERNET	PROFIBUS	PROFINET	Hardwire interface
M6000 UP PB 830L830001	X	X	X		X
M6000 UP PN 830L830002	X	X		X	X
M6001 UP PB 830L830003	X	X	X		X
M6001 UP PN 830L830004	X	X		X	X

M6000 UP PB **M6000 UP PN** **M6001 UP PB** **M6001 UP PN**

Fig.3. M600x UP variants

N.B.
For layout reasons, in the next pages of this Manual, the M6000 UP PB model will be shown as a representative image of the various models of the M6000 UP and M6001 UP devices.

5.1 *Components of an Electromechanical Balancing System*

A complete electromechanical Balancing System for one machine tool spindle consists of the following components:

- A Balancing Module M600x UP,
- An Automation System or a standard PC, based on Microsoft Windows®, and corresponding hardware,
- A DSCC Software,
- An Acceleration Sensor,
- A Transmitting Unit (Transmitting Coil),
- A Proximity Switch M8×1 or M12×1, alternative integrated into the transmitting unit,
- An electromechanical Balancing Unit with or without neutral position capability and built-in or external receiver (balancing head, balancing ring or spindle integrated system),
- Connection and extension cables, as required.

5.2 *Maximum permitted Speed of Internal and External Balancing Heads*

5.2.1 *Internal Balancing Heads*

Outer Diameter [mm]	38	42	50	55	60	70
Maximum Capacity [cm-g]	200	500	1,100	1,500	2,000	3,300
Maximum Speed [RPM]	20,000	15,000	10,000	8,500	7,500	6,000

5.2.2 *External Balancing Heads*

Outer Diameter [mm]	80	102	122
Maximum Capacity [cm-g]	800	2,500	5,000
Maximum Speed [RPM]	10,000	5,500	4,000

5.2.3 *External Balancing Heads with attached Stator*

Outer Diameter [mm]	80	102	122
Maximum Capacity [cm-g]	800	2,500	5,000
Maximum Speed [RPM]	10,000	5,500	4,000

5.3 *Principle of the M600x UP Balancing System (RS-232 or Ethernet module) on M6000 UP PB*

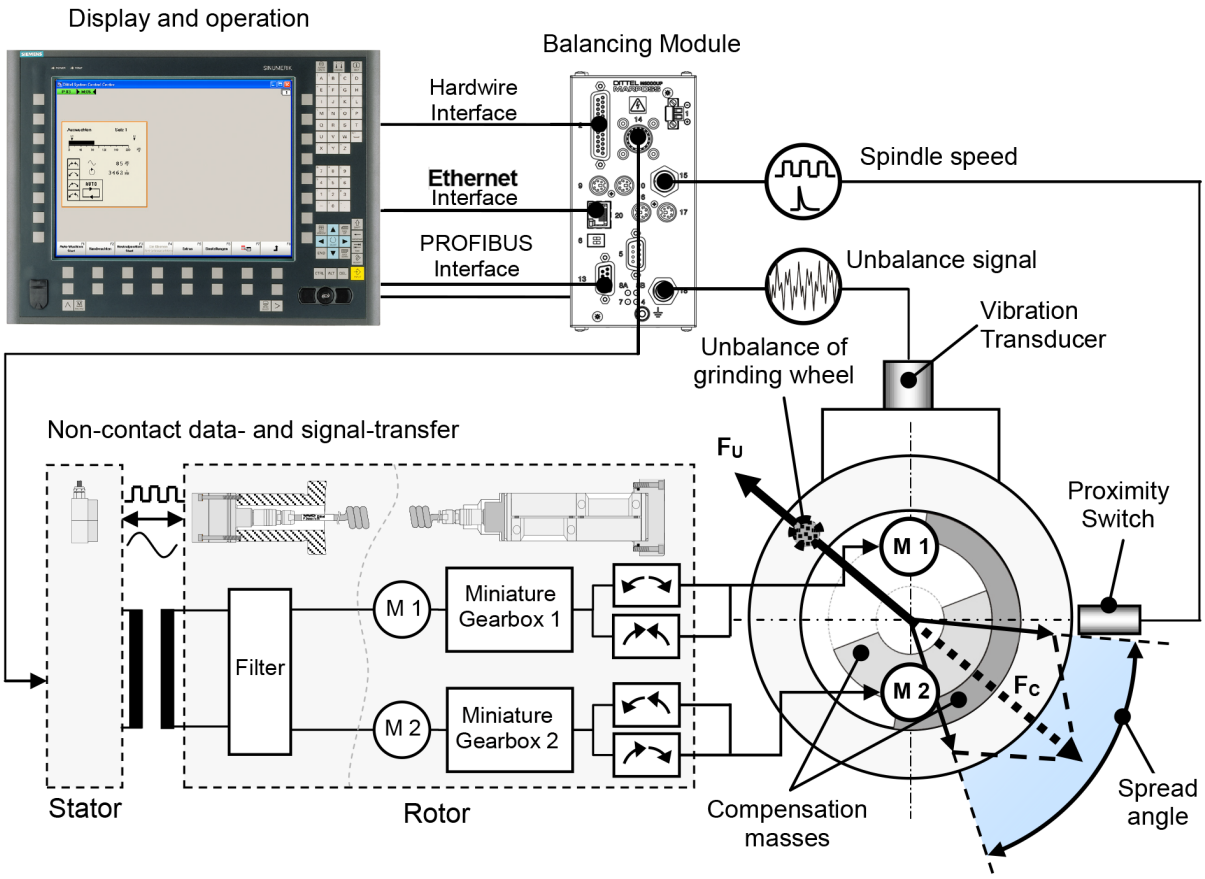


Fig.4. Example of a Principle of the M600x UP Balancing System (RS-232 or Ethernet module) on M6000 UP PB

5.3.1 *Connection of different DS6000 UP Modules*

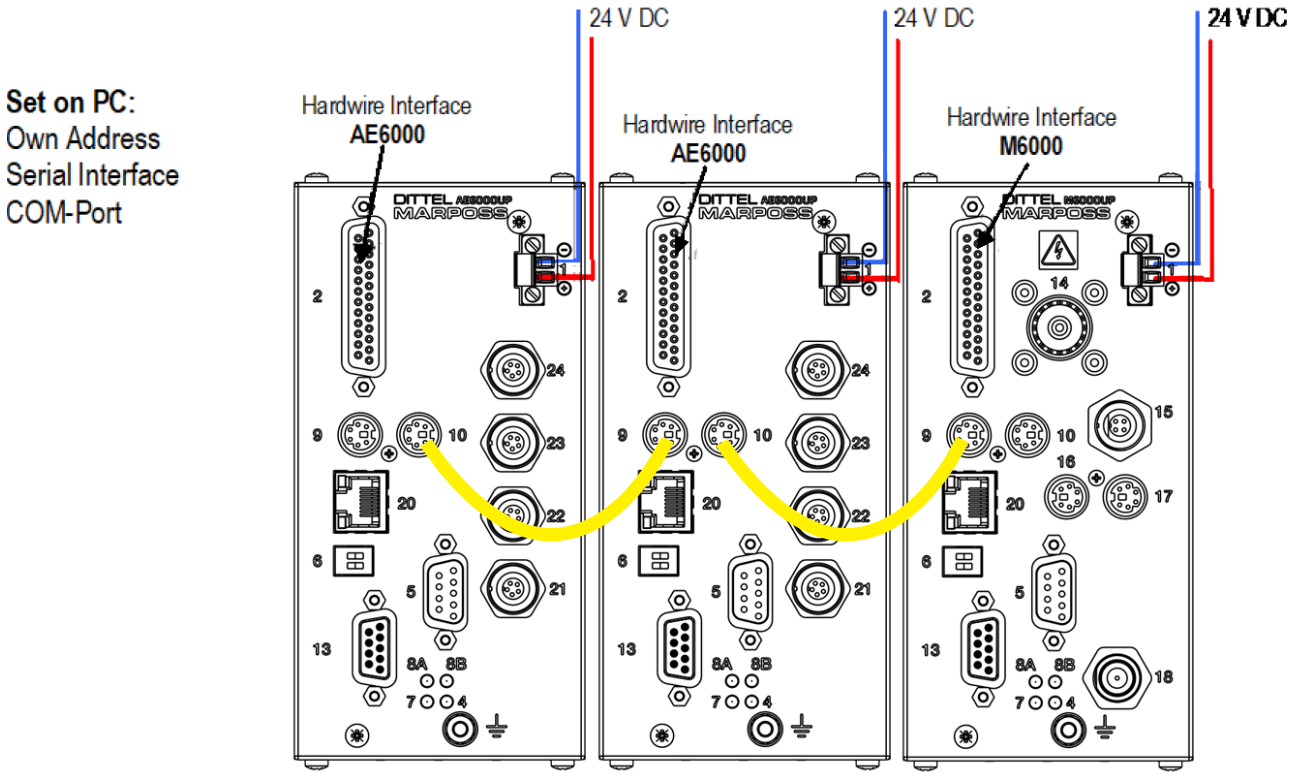


Fig.5. Example of a monitoring of connection of different DS6000 UP Modules

5.4 *Overall dimensions*

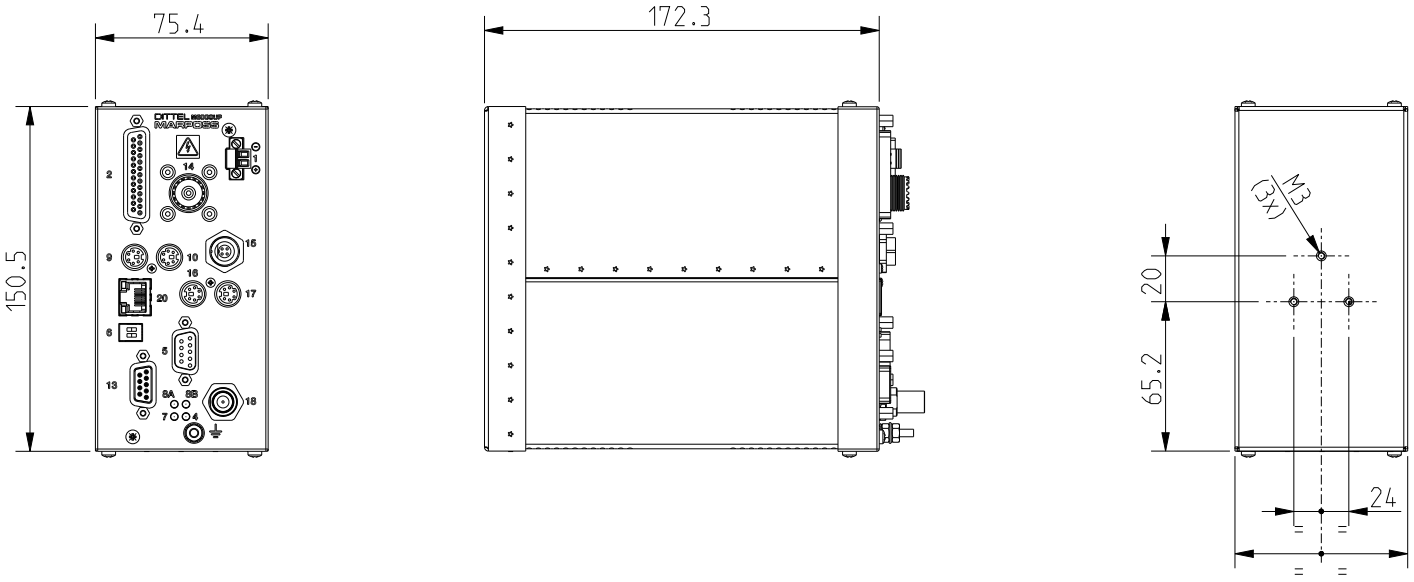


Fig.6. M600x UP dimensions

5.5 *Technical Specifications*

Supply, nominal Range	Direct current ⎓ 24 Vdc (± 25%) SELV type	
Power Consumption	ca. 47 Watts	
Internal Fuse	4 Amps, resettable fuse (Poly Switch RUE 250)	
External Fuse	4 Amps, time-lag, IEC 60127 type, (T4A)	
Environmental Temperature	0 °C … +50 °C (32 °F … 122 °F)	
Pollution Degree 2	Do not use in environment with conducting pollutants	
Altitude	0 - 2,000 m (0 - 6,562 ft.)	
Relative Humidity	20% - 80%, without Condensation	
Safety Class	IP 20	
In-/Outputs	24 Vdc, according EN 60950 SELV Hardwire Interface Serial Interface RS-232 Ethernet Interface Serial Interface RS-422 PROFIBUS / PROFINET Interface To Transmitter Coil of Balancing Unit From Proximity Switch From Acceleration Sensor Chassis Ground	# 1 # 2 # 5 # 20 # 9 and # 10 # 13 # 14 # 15 and # 16/# 17 # 18 Stud and Hex Nut M4
Displayed Unbalance Range	0 µm/s to 1000 µm/s; the unbalance display is only true with a Acceleration Sensor having a sensitivity of 1000 pC/g and a Sensor Adaptation setting (divider ratio) of :1.	
Displayed Speed Range	72 rpm to 30,000 rpm	
Speed Range while Balancing	300 rpm to 30,000 rpm	
Hardwire Interface Connector # 2		
All digital Inputs	Input Signal LOW Input Signal HIGH Input Current	-30 Vdc … +3 Vdc +13 Vdc… +30 Vdc typical 5.5 mA at 24 Vdc
Digital Outputs, pin 1 to 5, 8, 10 and 11	Output Current Recommended Load Power Dissipation of Switching Transistor	10 mA 2k2 … 4k7 at 24 Vdc **Drive inductive load with clamping diode only!** maximum 75 mWatts
Digital Outputs, pin 6 and 7	Output Current overload proof Total of Output Currents Voltage Drop at Output Output Leak Current Recommended Load	maximum 500 mA, short-circuit and maximum 2 Amps maximum I_{Load} × 0.4 ohm maximum 10 µA 2k2 … 4k7 at 24 Vdc
Analog Output 22	"Filtered Unbalance Signal" 500 rpm to 30,000 rpm 0 … 1,000 µm/s correspond to 0 … 10 Vdc / -5% 300 rpm to 30,000 rpm 0 … 1,000 µm/s correspond to 0 … 10 Vdc / -10%	
Analog Output 23	"Raw Unbalance Signal" 500 rpm to 30,000 rpm 0 … 1,000 µm/s correspond to 0 … 10 Vdc / -5% 300 rpm to 30,000 rpm 0 … 1,000 µm/s correspond to 0 … 10 Vdc / -10%	
Analog Output 24	"Speed Signal" 80 … 10,000/ 20,000/ 30,000 rpm (adjustable) correspond to 0 … 10 Vdc	

Serial Interface, Connector # 5	
	RS-232-C Interface Hardware-handshake RTS/CTS, 8 Data bits, Baud Rate adjustable via DSCC Software to 19,200, 38,400 or **57,600 Baud**, 1 Stop bit, no Parity.
Ethernet interface, Connector # 20	
	RJ45 Port, Ethernet 10BASE-T or 100BASE-TX (Auto-Sensing) LED indicators Network connected (lights green) and Data transfer (flashes yellow)
PROFIBUS interface, Connector # 13	
	Standard DB-9 Connector, female All input and output signals managed through Hardwire Interface of standard DB-25 Connector # 2 can be driven even through PROFIBUS/PROFINET interface.
PROFINET interface, Connector # 13	
	RJ45 Port, Ethernet 100BASE-TX with Autocrossover, the minimum cable requirement is Cat 5e with SF/UTP shielding. LED indicators Network connected (lights yellow) and Data transfer (flashes green)
Maximum number of modules on a machine control unit (computer, automation system)	15
Accessory supplied	CD-ROM or DVD containing DSCC Software and Installation Manuals (1) 24 Vdc Cable Plug (1), Standard DB-25 Connector, male, with shell (1)
Module Weight	ca. 1.5 kg (3.3 lbs.) without mounting hardware
Dimensions	Mounting Panel width 79 mm, height 186 mm, Front Panel width 75.4 mm height 150.4 mm Depth 180 mm including Mounting Panel to leading edge of Front Panel

N.B.
When a conducted RF interference of 10 V in the frequency range of 150 kHz to 1 MHz occur on the sensor cables - leading to connectors # 21, # 22, # 23 and # 24 of Module M600x UP - measurement results may be partially overdriven (increase from approximately 50% to 100%) since this is the useful frequency range of the AE sensors.

6 INSTALLATION

The Module M600x UP is intended to be installed in control cubicles. Mounting hardware is available for installation on vertical surfaces, either a mounting panel (Mounting Set 6000-rear panel, article number O10L0001001) or a clamping device for DIN mounting rails (Mounting Set 6000-clamping device, article number O20L0001001).

6.1 *Mounting on vertical surface*

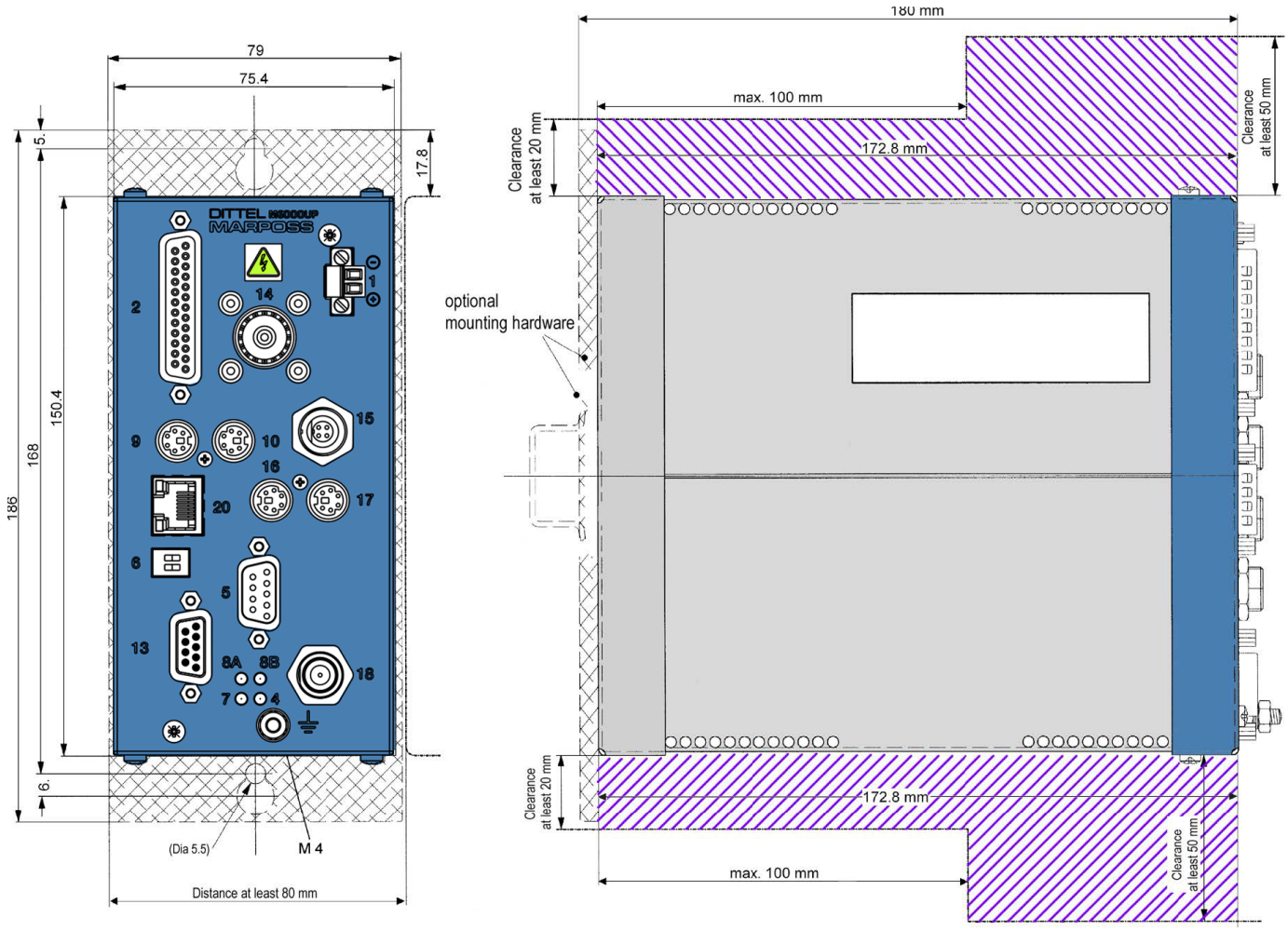


Fig.7. Example of M600x UP mounting on vertical surface

6.2 *Mounting on DIN guide*

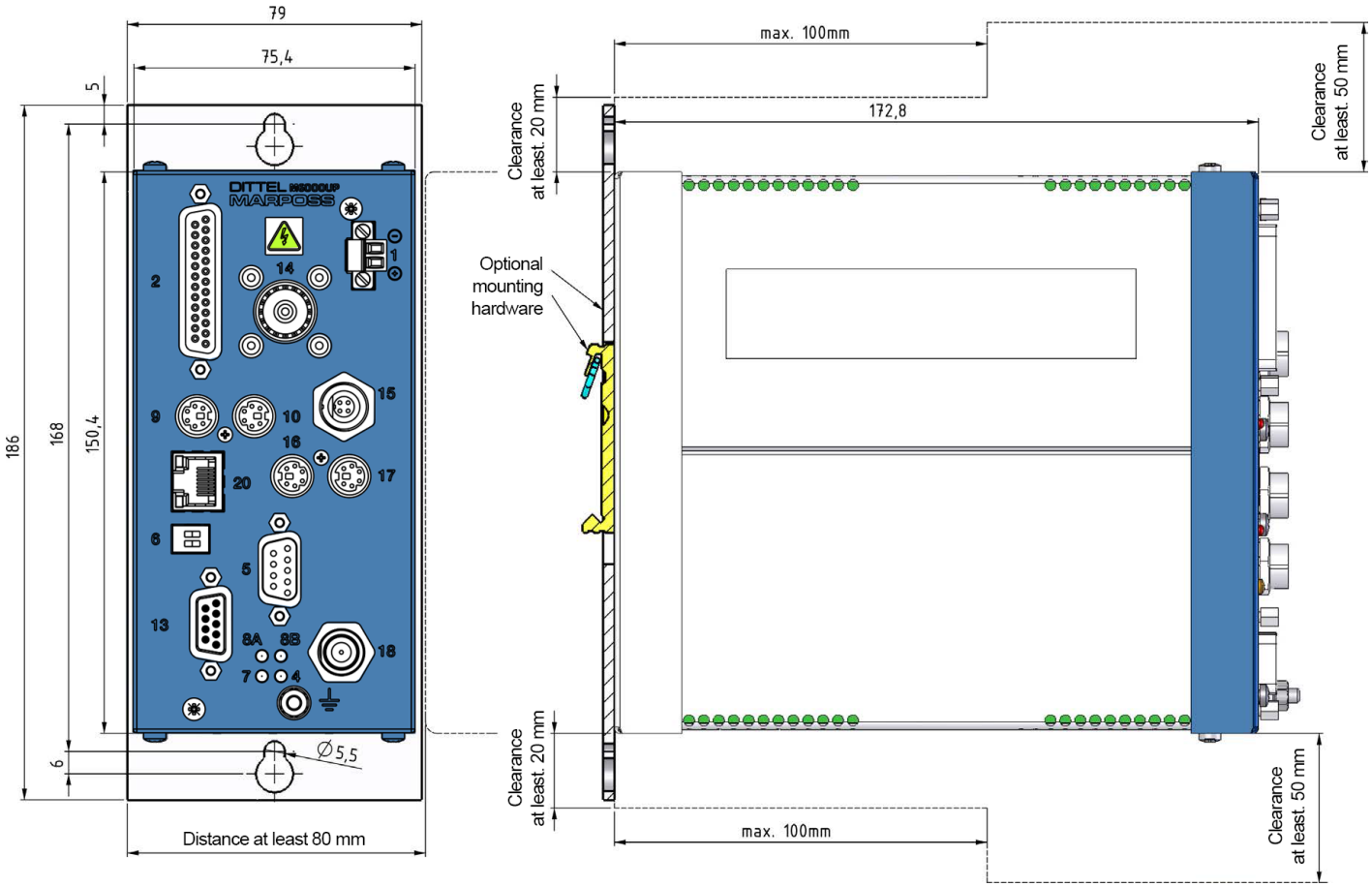


Fig.8. Example of M600x UP mounting on DIN guides

6.3 *Acceleration Sensor*

The location and installation of the Acceleration Sensor are crucial to successful operation of the M600x UP Balancing System!
Each spindle to be balanced must be equipped with its own Acceleration Sensor!
For M6000 UP Balancing System the unbalance display is only true with a fictional Acceleration Sensor having a sensitivity of 1000 pC/g and a Sensor Adaptation setting of :1.
For M6001 UP Balancing System the unbalance display is only true with a fictional Active Acceleration Sensor having a sensitivity of 300 mV/g and a Sensor Adaptation setting of :1.

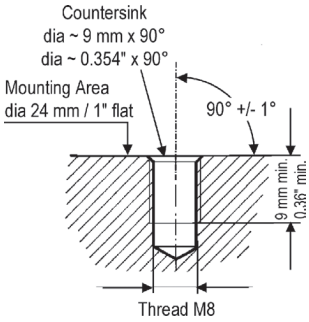
6.3.1 *General Installation of Acceleration Sensor*

GENERAL

The Acceleration Sensor is mounted on the machine tool, either permanently stud mounted, or kept by magnetic force. Use the magnetic mount Acceleration Sensor preferably for temporary unbalance measurements or/and to localize the best place for a stud mounted Acceleration Sensor
Due to the wide variety of grinding machine characteristics, no statement about the best Acceleration Sensor location can be made. Following are two general rules that should help to find the proper Transducer location:

Mount the Acceleration Sensor on a rigid part of the machine structure, where vibration from the spindle will be accurately transmitted. For example, a good location is on the spindle housing, as close as possible to the spindle bearing at the wheel side.
Mount the Acceleration Sensor in the same direction as the centreline between the grinding wheel and the work piece. The Acceleration Sensor should always be aligned at the wheel end of the machine.
For standard dimensions of Acceleration Sensors, please contact our nearest representative.

FASTENING SCREW THREAD

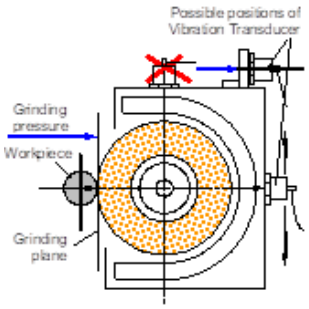


For best measurement results, grind or machine a smooth, flat area of at least 24 mm diameter. For permanent stud mounting prepare a tapped hole fitting the connecting part of Acceleration Sensor, which must be perpendicular within 1° of the mounting surface to ensure no gaps are present between the base of the Sensor and the structure. Before mounting the Acceleration Sensor inspect the area to insure that no metal burrs or other foreign particles interfere with the contacting surfaces. Apply a coupling fluid like silicone grease to achieve a high degree of intimate surface contact.

WARNING
To avoid risk of damage, tighten the Sensor with not more than 8 N-m (0.8 kilogram-meter).

N.B.
In case of M6001UP use only Active Acceleration Sensors.

MOUNTING EXAMPLES



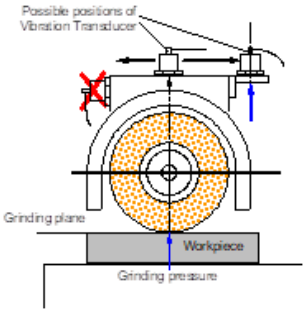
Cylindrical or Centerless Grinder

Arrangement of a Acceleration Sensor in horizontal direction on a cylindrical or centerless grinder.

N.B.
Measurement direction parallel to the direction of grinding pressure or perpendicular to the grinding plane.

Surface grinder

Arrangement of a Acceleration Sensor in vertical direction on a surface or creep feed grinder.



N.B.
Measurement direction parallel to the direction of grinding pressure or perpendicular to the grinding plane.

6.3.2 *Proximity Switch (Speed Sensor)*

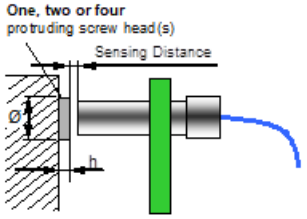
WARNING
Risk of injury from rotating parts!
Switch OFF the machine when installing or adjusting the Speed Sensor! Ensure that the rotor has stopped, before working on it!
Protect the machine against unauthorized or accidental switching ON!
NEVER operate a machine tool without all safety guarding in place!

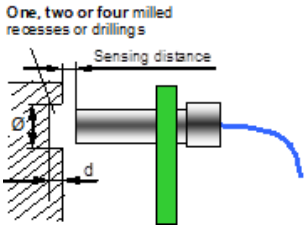
The Proximity Switch or Speed Sensor provides information on the speed or rotation. This is necessary to determine the phase relationship between measured vibration and the rotating spindle. Some of our Transmitter Coils (Stators) are equipped with a Proximity Switch. If not, installation of the Proximity Switch has to be done according to local conditions on the machine.

N.B.
For the phase related Balancing Strategy ‘Adaptive 2’ and/or the licensed functions ‘Single-Plane/Two-Plane Pre-Balancing’, the M600x UP may receive only ONE pulse per revolution!
Take the speed direct from the grinding spindle. A protruding screw head or a milled/drilled recess in the pulley may obtain this..

MOUNTING EXAMPLES

The Proximity Switch should be mounted such that the recess(es) or protrusion(s) pass(es) directly under the Proximity Switch’s face.
For safe switching the following dimensions should be kept:





	PROX M 12 × 1	PROX M 8 × 1
Ø	> 15 mm	> 10 mm
h / d	≥ 2 mm	> 1 mm
Sensing Distance	≤ 4 mm	≤ 2 mm

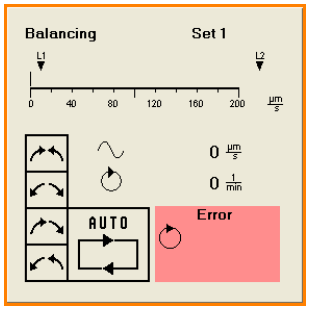
The diameter of the screw head(s) or the milled recess(es) or drilling(s) must be bigger than the diameter of the proximity switch.
Increase “h” / “d” at other materials as iron.

N.B.
When the M600x UP is operated exclusively in Balancing Strategy Normal or Adaptive 1, the Proximity Switch may receive also two or four pulses per revolution. The corresponding pulse ratio must then be set in the menu Current Settings → ‘RPM Input’ (refer to RPM Input Figure).
The type of the Proximity Switch (PNP or NPN) must be set using the Tab “M Parameter” (refer to Proximity Switch Type Figure).
After installing and adjusting all components on the machine, turn machine spindle or grinding wheel slowly by hand, if possible. Check for protruding or scratching parts..

CHECKING THE PROXIMITY SWITCH

Required:

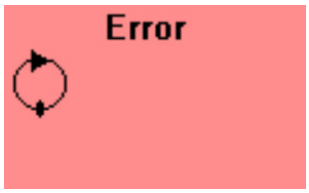
- The equipment M600x UP is completely installed, powered by 24 Vdc, the software is ready to run.
- Proximity switch is assembled carefully on the machine and connected to the M600x UP, socket # 15.
- The machine spindle is not turning!
- Ensure that NO external HIGH signal is applied at pin 21 of connector # 2 or on PROFIBUS/PROFINET; otherwise the ERROR message is blanked. If in doubt pull off the interface connector # 2.
- Open the Standard Balancing screen of the M600x UPModule concerned:



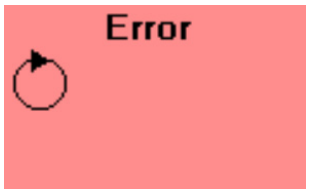
For example, it is shown:

- Unbalance: 0 µm/sec
- Speed: 0 rev/min (Spindle is not turning)
- Error: Speed error, because spindle is not turning

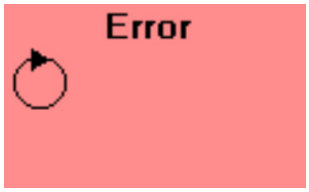
Check of Proximity Switch, when using protruding screw heads as reference:
Turn machine spindle slowly by hand, until the protruding part is congruent to the Proximity Switch's face. A vertical mark must appear on the proximity switch Error message.



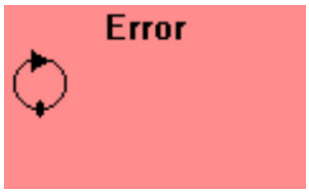
Turning the machine spindle further, the vertical mark must disappear.



Check of Proximity Switch, when using milled recesses or drillings as reference:
Turn machine spindle slowly by hand until the recess or drilling is congruent to the Proximity Switch's face. A proximity switch Error message without vertical mark must appear.



Turning the machine spindle further, the vertical mark must appear again.



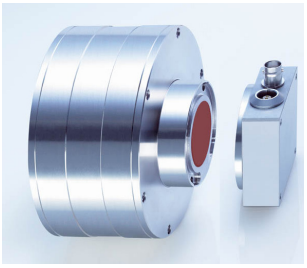
N.B.
Depending on the manufacturer of the Proximity Switch, a shining LED can also show the switching state. Please notice the respective data sheet of the manufacturer.

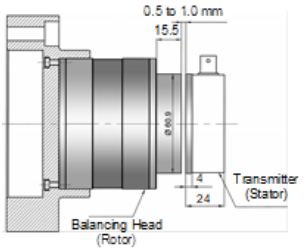
6.3.3 *Mechanical Balancing System*

WARNING
Risk of injury from rotating parts!
Switch OFF the machine when installing or adjusting the mechanical Balancing System or parts of it! Ensure that the machine spindle has stopped before working on it!
Protect the machine against unauthorized or accidental switching ON!
NEVER operate a machine tool without all proper safety guarding in place.
Mind the maximum permitted Speed of your Balancing System!

EXTERNAL BALANCING HEAD

Mount transmitter coil (Stator) and balancing head (Rotor) according our installation drawing on the machine. Align the transmitter coil axially to the balancing head to less than ± 0.3 mm. With a feeler gauge, adjust a distance of 0.5 to 1 mm between transmitter coil and balancing head by moving the transmitter coil axially towards the centre of the balancing head. Check for proper fastening of the balancing head and transmitter coil after adjustment.



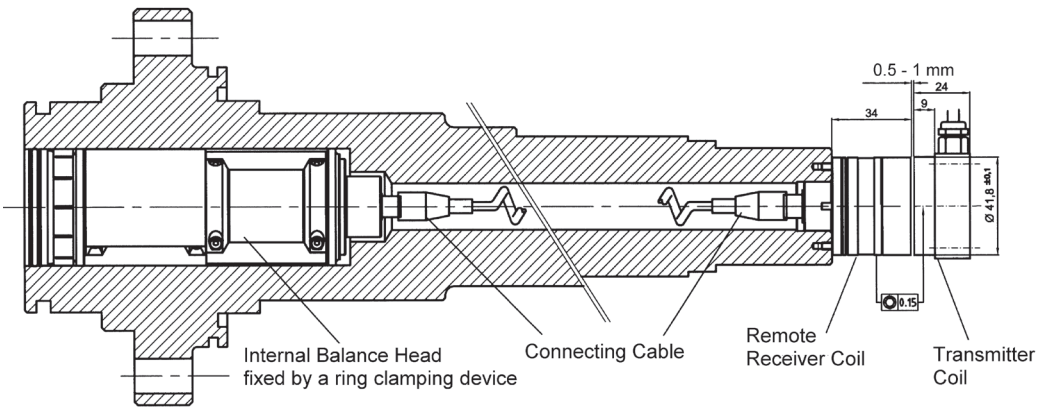


BALANCING RING

Mount ring coil and balancing ring according our installation drawing on the machine. Please make sure that the ring coil is congruently lined up to the coil in the balancing ring, axial offset should be less than ± 0.3 mm. With a feeler gauge, adjust a distance of 0.5 to 1 mm between ring coil and balancing ring. Check for proper fastening of the balancing ring and ring coil after adjustment.

INTERNAL BALANCING HEAD

Mount transmitter coil (Stator) and balancing head (Rotor) according our installation drawing on the machine. Align the transmitter coil axially to the balancing head to less than ± 0.3 mm. With a feeler gauge, adjust a distance of 0.5 to 1 mm between transmitter coil and balancing head by moving the transmitter coil axially towards the centre of the balancing head. Check for proper fastening of the balancing head and transmitter coil after adjustment.



N.B.
To avoid serious damage of the coupling or gearbox, never twist the balancing weights by hand!
The machine manufacturer must provide a precision-machined mounting bore in order to accept an Internal Balancing Head.
Mount transmitter coil, Balancing Head and remote receiver coil, if applicable, according our installation drawing on the machine. Align the transmitter coil axially to the balancing head coil or remote receiver coil to less than ± 0.3 mm. With a feeler gauge, adjust a distance of 0.5 to 1 mm between transmitter coil and receiver coil. Check for proper fastening of the Balancing Head, (remote receiver coil, if applicable) and transmitter coil after adjustment.

INTEGRATED BALANCING SYSTEM

N.B.
To avoid serious damage of the coupling or gearbox, never twist the balancing weights by hand!
To avoid risk of deformation by bending, never put the Integrated Balancing System on the flange!

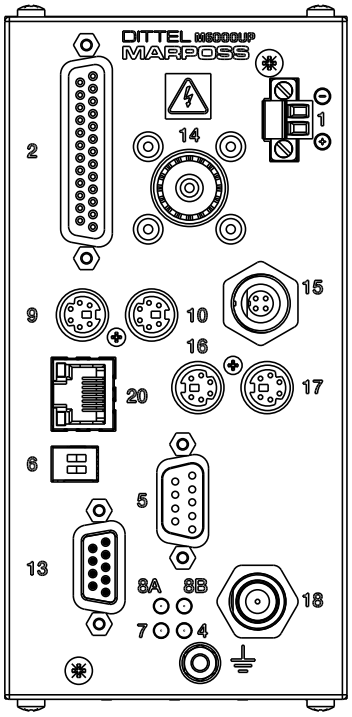
The machine manufacturer must provide a precision-machined mounting bore in order to accept an Integrated Balancing System.
Mount transmitter coil and Integrated Balancing System according our installation drawing on the machine. Align the transmitter coil axially to the receiver coil of the Balancing System to less than ± 0.3 mm. With a feeler gauge, adjust a distance of 0.5 to 1 mm between transmitter coil and receiver coil. Check for proper fastening of the Integrated Balancing System and transmitter coil after adjustment.

6.4 *Electrical Installation*

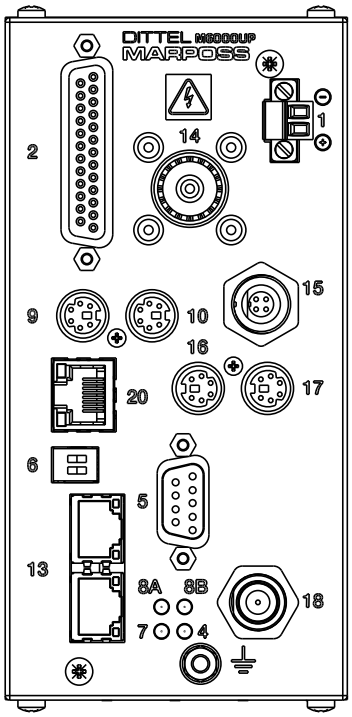
N.B.
To ensure proper function of the M600x UP Module(s) use only connection cables or extension cables supplied by Marposs.

N.B.
Secure all Standard DB Connectors by using the provided screw locks.
Safeguard cables with strain relief. Make sure that no tensile stress is exerted on the connectors by the connected cables.

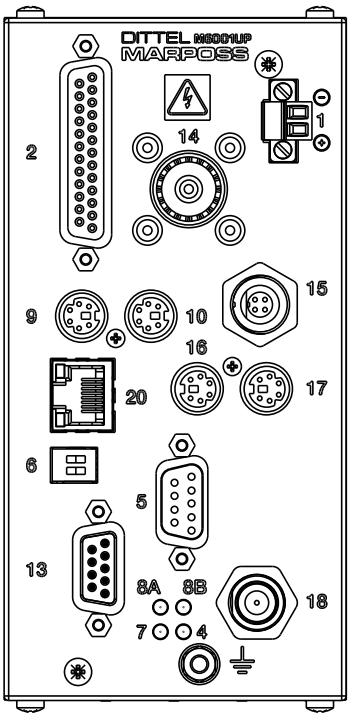
M6000 UP PB



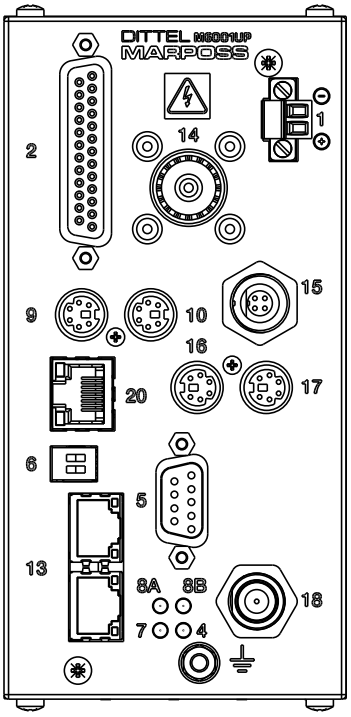
M6000 UP PN



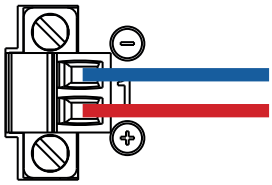
M6001 UP PB



M6001 UP PN



CONNECTOR # 1, 24 VDC SUPPLY



The supplied 2-pole DC plug with coded lugs fits the DC input of the M600x UP. For wiring, use stranded wires, cross section 1.0 to 1.5 mm², and wire-end sleeves.
Fix plug with both screws!
The M600x UP is switched ON and OFF by the external power supply, the Module itself contains NO ON/OFF switch.
Lack of supply voltage does not result in loss of information of the memory.

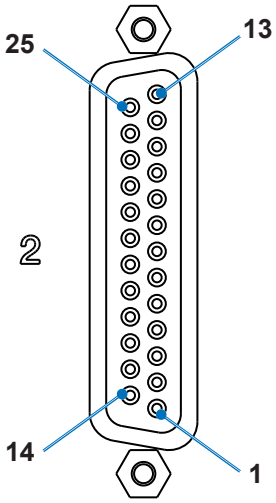
Contact	Signal
+	+ 24 Vdc ± 6 Vdc
-	Power Ground

N.B.
Wiring the supply must be made by qualified staff of the customer!

N.B.
Power the device from a 24 Vdc supply only! The power source must comply with EN 60950 SELV (Safety Extra Low Voltage). Applying a higher voltage can cause a damage of the device.

N.B.
The M600x UP module must be protected by an external fuse of 4 amps time-lag (T4A). This fuse must comply with IEC 60127 and must blow within 120 sec or less at a current of 8.4 amps.

CONNECTOR # 2, HARDWIRE INTERFACE OF THE BALANCING FUNCTION



Type: Standard DB-25 Connector, female
Static interface of the Balancing Function to the Automation System.
Via the inputs, the Automation System using HIGH or LOW signals can control the Balancing Module M600x UP.
Via the outputs, the Automation System receives various messages from the M600x UP as HIGH or LOW signals.

N.B.
Wiring the interface mating plug # 2 (supplied) to the machine control must be made by qualified staff.

N.B.
Use only shielded cable (shield connected to mating plug housing), cross-section of the cable 0.25 sq mm (#24 AWG) minimum.

N.B.
Cover the solder joints on the 25-pole mating plug with shrinking tube.

N.B.
Safeguard cables with strain relief.

Pin no.	Function	Input/ Output	Signal name / Action
1	Monitoring Status	O	While Balancing: HIGH at the Output
2	Monitoring System	O	Speed Sensor Signal and Acceleration Sensor Signal OK: HIGH at the Output Speed Sensor Error, Acceleration Sensor Error, Transmitter-short-circuit, Balancing Time Exceeded, balancing cycle fails 5-times in a row, Neutral Position Start with speed bigger 500rpm, Neutral Position Start with unsuitable Balancing Head: LOW at the Output (see also appendix B)
3	Monitoring Balancing Time	O	Balancing Time exceeded: LOW at the Output
4	Monitoring Unbalance Limit 1	O	Below Unbalance Limit 1: HIGH at the Output Above Unbalance Limit 1: LOW at the Output
5	Monitoring Unbalance Limit 2	O	Below Unbalance Limit 2: HIGH at the Output Above Unbalance Limit 2: LOW at the Output
6	Monitoring Speed Limit 1	O	Speed below Speed Limit 1: HIGH at the Output Speed above Speed Limit 1: LOW at the Output
7	Monitoring Speed Limit 2	O	Speed below Speed Limit 2: HIGH at the Output Speed above Speed Limit 2: LOW at the Output
8	Monitoring Neutral Position	O	Weights have reached the Neutral Position: HIGH at the Output
9	CM	I	+24 Vdc, must comply with EN 60950 SELV, for example from Machine CNC Control
10	Monitoring Turn-off Threshold	O	Turn-off Threshold reached: HIGH at the Output
11	Monitoring Neutral Position Active	O	While weights turning towards Neutral Position: HIGH at the Output
12	Automatic Balancing Start/Stop	I	Static Signal from LOW to HIGH: Balancing START Static Signal from HIGH to LOW: Balancing STOP
13	Neutral Position Start/Stop	I	Static Signal from LOW to HIGH: Weights turning towards Neutral Position START Static Signal from HIGH to LOW: Weights turning towards Neutral Position STOP
14	Operation via keys or buttons inhibit	I	Static HIGH Signal: Operator actions on the PC or Automation System keyboard/softkeys are disabled
15	Set Number Selection 1	I	see following Truth Table
16	Set Number Selection 2	I	see following Truth Table
17	Set Number Selection 3	I	see following Truth Table
18	Set Number Selection 4	I	see following Truth Table
19	Blanking of the Unbalance Reading	I	Static HIGH Signal: Blanking of the Unbalance Reading, e.g. while grinding
20	24 Vdc Ground	I	24 Vdc Power Ground
21	Blanking of the Proximity Switch Error Reading	I	Static HIGH Signal: Blanking of the Proximity Switch Error Reading, e.g. at Spindle Stop
22	Analog Output “Filtered Unbalance Signal”	O	300 rpm to 30,000 rpm: 0 …1000 µm/s correspond to 0 … 10 Vdc / -5% 300 rpm to 30,000 rpm: 0 …1000 µm/s correspond to 0 … 10 Vdc / -15% Output equivalent to reading at display, coordinates, PROFIBUS

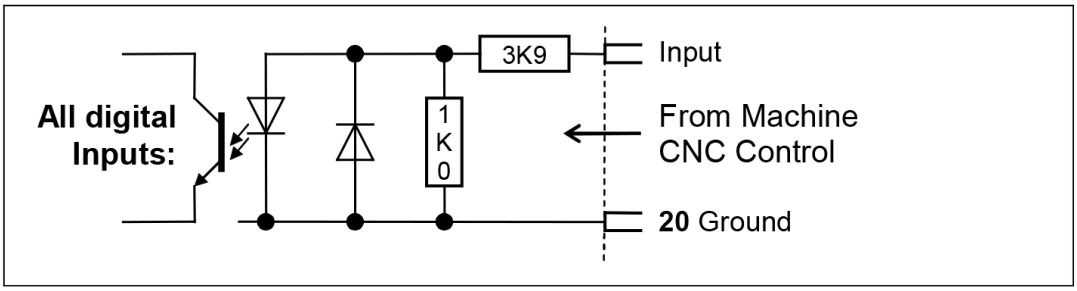
23	Analog Output “Raw Unbalance Signal”	O	300 rpm to 30,000 rpm: 0 …1000 µm/s correspond to 0 … 10 Vdc / -5% 300 rpm to 30,000 rpm: 0 …1000 µm/s correspond to 0 … 10 Vdc / -15%
24	Analog Output "Speed"	O	80 … 10.000/20.000/30.000 1/min (adjustable) correspond to 0 … 10 V each
25	Analog Ground	-	Common Analog Ground of Outputs 22, 23, 24

Connector # 2,
Truth table, to select appropriate Set no. by the machine CNC control:

N.B.
During Automatic Balancing, NO change of the Set Number is permitted. A change is not recognized by the unit or not possible!

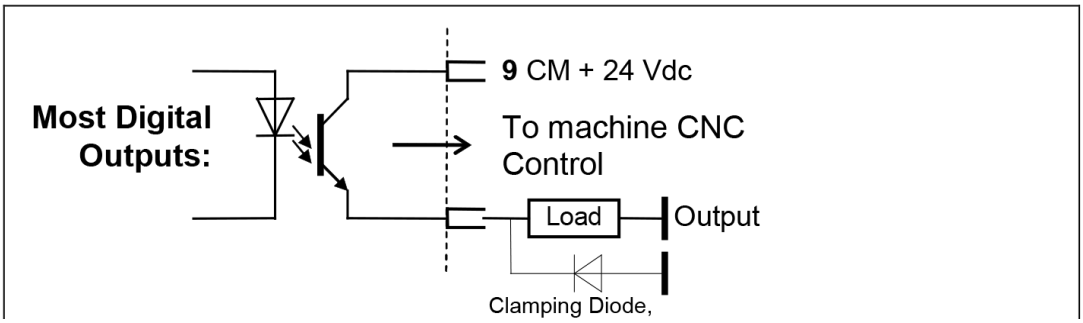
Set no.	# 2/pin 15	# 2/pin 16	# 2/pin 17	# 2/pin 18
No change	LOW	LOW	LOW	LOW
1	HIGH	LOW	LOW	LOW
2	LOW	HIGH	LOW	LOW
3	HIGH	HIGH	LOW	LOW
4	LOW	LOW	HIGH	LOW
5	HIGH	LOW	HIGH	LOW
6	LOW	HIGH	HIGH	LOW
7	HIGH	HIGH	HIGH	LOW
8	LOW	LOW	LOW	HIGH
9	HIGH	LOW	LOW	HIGH
10	LOW	HIGH	LOW	HIGH
11	HIGH	HIGH	LOW	HIGH
12	LOW	LOW	HIGH	HIGH
13	HIGH	LOW	HIGH	HIGH
14	LOW	HIGH	HIGH	HIGH
15	HIGH	HIGH	HIGH	HIGH

Connector # 2, specification of all digital inputs:



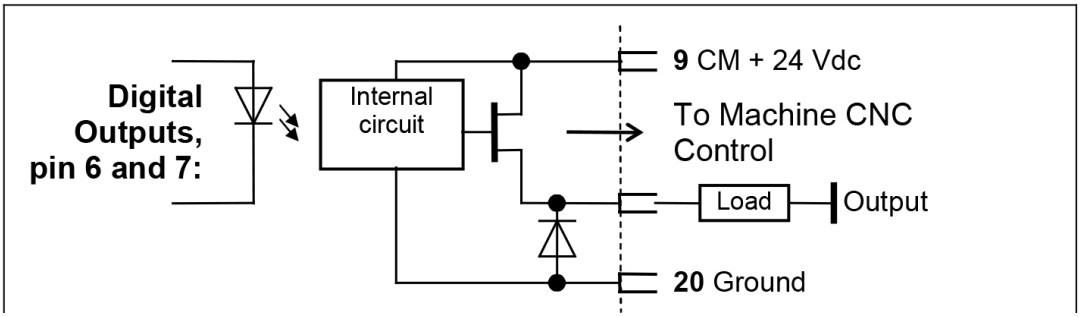
Input Signal LOW:	-30 Vdc … +3 Vdc
Input Signal HIGH:	+13 Vdc … +30 Vdc
Input Current:	typical 5.5 mA at 24 Vdc

Connector # 2, specification of digital outputs, refer to pins 1 to 5, 8, 10 and 11:



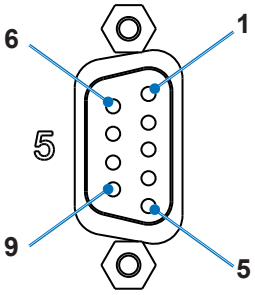
Output Current:	10 mA
Recommended Load:	2.2 kΩ – 4.7 kΩ at 24 Vdc **Drive inductive load with clamping diode only!**
Power dissipation of Switching Transistor:	75 mW maximum

Connector # 2, specification of digital outputs, refer to pin 6 and 7:



Output Current:	500 mA max. short circuit proof and over-load protected
Total of all Output Currents:	2 amps maximum
Voltage Drop across Output:	I_{Load} × 0.4 ohm maximum
Output Leak Current:	10 µA maximum
Recommended Load:	2.2 kΩ – 4.7 kΩ at 24 Vdc

CONNECTOR # 5

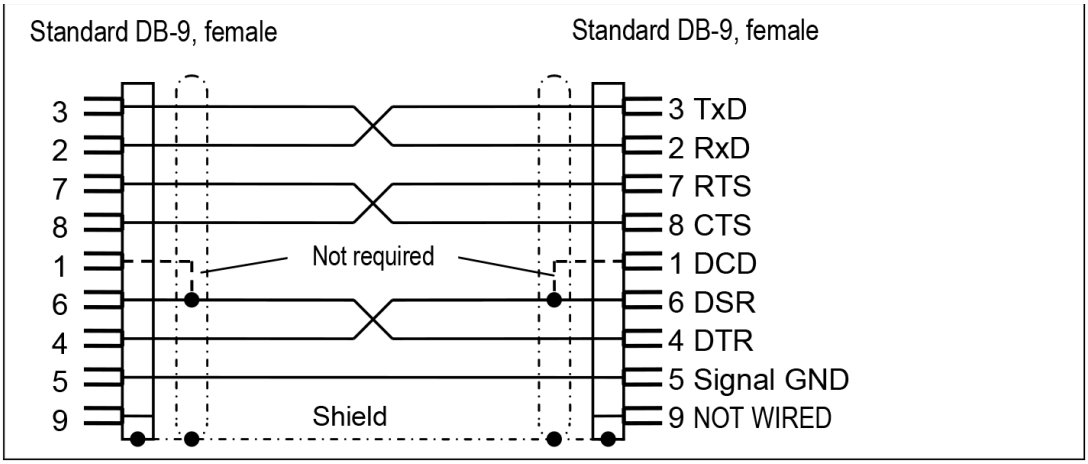


Type: Standard DB-9 Connector, male
RS-232-C Software Interface to operate the M600x UP Module through a computer based Automation System or a standard Windows® Computer (Windows® 7 / 10) and additional DSCC Software.

Pin no.	Input/ Output	Signal name
1	In	DCD
2	In	RxD
3	Out	TxD
4	Out	DTR
5	-	Signal GND
6	In	DSR
7	Out	RTS
8	In	CTS
9	-	not wired

Connect Module's Connector # 5 by a shielded 9-pole Serial Interface cable to an available serial port of your Automation System or Computer.

Serial Interface Cable to connect a PC or Automation System

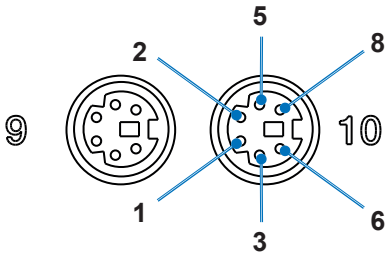


Serial Interface Cable

5 m	A/N O67L0010500 (A/N K0010500)	10 m	A/N O67L0011000 (A/N K0011000)
15 m	A/N O67L0011500 (A/N K0011500)	20 m	A/N O67L0012000 (A/N K0012000)

CONNECTORS # 9 AND # 10

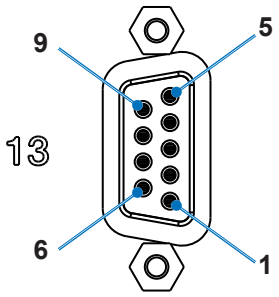
N.B.
These sockets are used to connect up more than one DS6000 UP Module!
The first and last Module of the network has to be terminated (refer to 3.3.1 Setting the DIP-Switch # 6, switch SW2 = ON).



Type: 6-pole Miniature Sockets
When operating more than one DS6000 UP Module they must be connected up by special Patch Cords, length e.g. 18 cm/ 7" (A/N O67L0020018, formerly A/N K0020018).
At Modules placed side by side, practically Connector # 9 is connected to Connector # 10 of the next Module and so on. However, connecting Connector # 9 to # 9 or Connector # 10 to # 10 is permitted as well.

Pin no.	Signal name
1	not connected
2	not connected
3	CAN-H
5	COMM GND
6	not connected
8	CAN-L

CONNECTOR # 13, PROFIBUS INTERFACE OF THE BALANCING FUNCTION (ONLY FOR M600X UP MODULES WITH PROFIBUS INTERFACE)

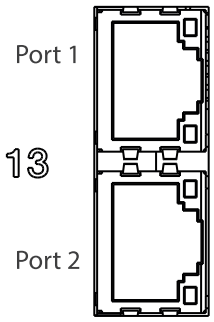


Type: Standard DB-9 Connector, female
All input and output signals managed through Hardwire Interface of standard DB-25 Connector # 2 can be driven even through PROFIBUS/PROFINET interface.
Connection to a PROFIBUS Interface of an Automation System or PC requires special PROFIBUS-cable and -plug.

N.B.
Qualified staff of the customer must make the wiring of the PROFIBUS Interface, Connector # 13, to the PC or Automation System!

Pin no.	Signal name
1	not connected
2	not connected
3	RxD/TxD-P (Data line B)
4	CNTR-P
5	DGND (Data reference potential)
6	VP (Power supply plus)
7	not connected
8	RxD/TxD-N (Data line A)
9	not connected

CONNECTOR # 13, PROFINET INTERFACE OF THE BALANCING FUNCTION (ONLY FOR M600X UP MODULES WITH PROFINET INTERFACE)



Type: Double Ethernet socket
Replaces all digital inputs and outputs of the Hardwire Interface, Connector # 2.
All input and output signals managed through Hardwire Interface of standard DB-25 Connector # 2 can be driven even through PROFIBUS/PROFINET interface.

LED indicators: Network connected (lights yellow) and Data transfer (flashes green)

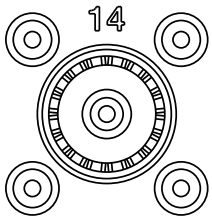
N.B.
Qualified staff of the customer must make the wiring of the PROFINET Interface, Connector # 13, to the PC or Automation System! The minimum cable requirement is Cat 5e with SF/UTP shielding.

N.B.
The PROFINET implementation is certified to PNIO version V2.42. The interface is certified to Conformance Class A, B and C. The M600x UP PROFINET module uses only Conformance Class A. The network load was tested to Class III.

N.B.
The MAC address of the PROFINET module is shown on the rating plate of the M600x UP module.
- The MAC address of port 1 is: MAC address of the PROFINET module + 1
- The MAC address of port 2 is: MAC address of the PROFINET module + 2
- Example: MAC address of PROFINET module: 70:B3:DB:00:80:CE
- MAC address of PROFINET port 1: 70:B3:DB:00:80:CF
- MAC address of PROFINET port 2: 70:B3:DB:00:80:D0

N.B.
In case of upgrade of DITTEL M600x Module(s) with M600x UP Module(s), the GSDML file used for interfacing with the former device must be replaced with a new one tailored on DS6000UP models

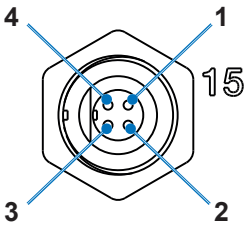
CONNECTOR # 14



Type: UHF Socket
Connect the Transmitting Unit of the Balancing System to this connector # 14 using a co-axial cable (one end UHF-plug, other end BNC-socket).

WARNING
Risk of injury from high voltage!
On Connector # 14 a voltage up to 30 V_{RMS} may appear.
Never operate the Module M600x UP without transmitter unit connected or without protecting cap!

CONNECTOR # 15

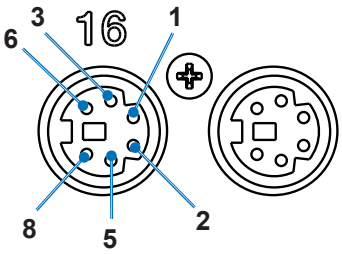


Type: 4-pole Miniature Socket
Standard connector of the Proximity Switch. The Proximity Switch is either a part of the Transmitter Unit of the Balancing System or mounted separately at the machine tool to provide information on the speed of the rotor.
Connect the Proximity Switch via a Prox Switch Cable to this socket # 15.
Mechanical installation of the Proximity Switch, see paragraph “6.3.2 Proximity Switch (Speed Sensor)” on page 27.

N.B.
Qualified staff of the customer must make the wiring of the PROFIBUS Interface, Connector # 13, to the PC or Automation System!

Pin no.	PNP Prox Switch	NPN Prox Switch
1	Supply +24 Vdc	Supply +24 Vdc
2	PNP rpm Input	NPN rpm Input
3	Supply 0 Vdc (Gnd)	Supply 0 Vdc (Gnd)
4	Screen/Chassis Ground	Screen/Chassis Ground

CONNECTORS # 16 AND # 17

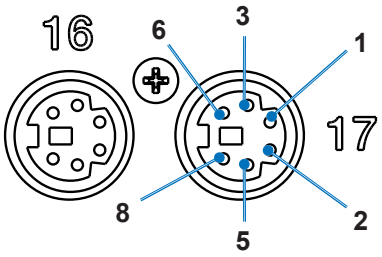


Type: Two 6-pole Miniature DIN-Sockets

Connector # 16:
Special speed input, for example for the switching pulses from the encoder interface of SIEMENS® Terminal Module TM41.
Pulse duration 20 µsec minimum! For units with serial number O18xxxxxx or later, 1 µs is permitted.
For proper use, use a suitable data cable with nominal impedance of 120 Ohms, or our prefabricated special cable A/N O67L1160XXX (A/N K116XXXX).

N.B.
For the phase-related Balancing Strategy ‘Adaptive 2’ and/or the licensed feature Single-Plane/Two-Plane Pre-Balancing the encoder interface must supply a speed signal, the phase of which is related to the spindle. Without phase reference, balancing is not possible.
For the phase related Balancing Strategy ‘Adaptive 2’ and/or the licensed feature ‘Single-Plane/Two-Plane Pre-Balancing’, the M600x UP may receive only ONE pulse per revolution from the encoder interface!

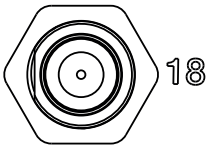
Pin no.	Signal name
1	not connected
2	not connected
3	Encoder Signal 0 Vdc (Ground)
5	RS-422 + (Encoder Signal HIGH)
6	RS-422 - (Encoder Signal LOW)
8	not connected



Connector # 17:
Output to pass the Speed Signal to a second Balancing Module, e.g. if one Speed Signal is used for two spindles.
The Proximity Switch signal from Connector # 15 is passed as well as the Encoder signal from Connector # 16!
For this use, connect Connector # 17 of the first unit to Connector # 16 of the second unit by our prefabricated special Patch Cords, length 18 cm/7", A/N O67L0020018 (A/N K0020018).

Pin no.	Signal name
1	not connected
2	not connected
3	Encoder Signal 0 Vdc (Ground)
5	RS-422 + (Encoder Signal HIGH)
6	RS-422 - (Encoder Signal LOW)
8	not connected

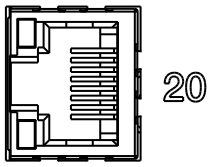
CONNECTOR # 18



Type: Female BNC-Socket
Connect the Acceleration Sensor using a coaxial cable (one end TNC-, other end male BNC plug) to connector # 18. Mechanical installation of the Acceleration Sensor, see paragraph "6.3.1 General Installation of Acceleration Sensor" on page 26.
To avoid electrical interference route the coaxial cable of the Acceleration Sensor as far as possible from cables carrying heavy current!

N.B.
In case of M6001 UP use only Active Acceleration Sensors.

CONNECTOR # 20



Type: RJ45-Jack
Connect the RJ45 jack via a ready-made Ethernet cable with an Ethernet Hub or Switch, which in turn is connected to the Ethernet network interface card of the Automation System.
If you want to connect the M600x UP Module directly to the Ethernet network interface card of a notebook computer, an Ethernet Cross Over cable may be required.
LED indicators: Ethernet cable connected (lights green) and Data transfer (flashes yellow)

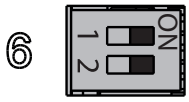
GROUND TERMINAL, STUD M4 AND HEX NUT

To reduce electrical interference make sure that the Module M600x UP, all balancing components and the machine CNC control are on a common mass potential. If this is not guaranteed by the installation on the machine all components must be bonded by suitable bonding straps to a common local earth (ground).

- The bonding straps should be as short as possible, the cross section as big as possible (recommended 16 mm²).
- Use cable lug for high-quality connection!

6.5 *Settings before getting started*

6.5.1 *Setting the DIP-SWITCH # 6*



N.B.
Before getting started the M600x UP, some settings must be carried out with the two switches, if applicable!

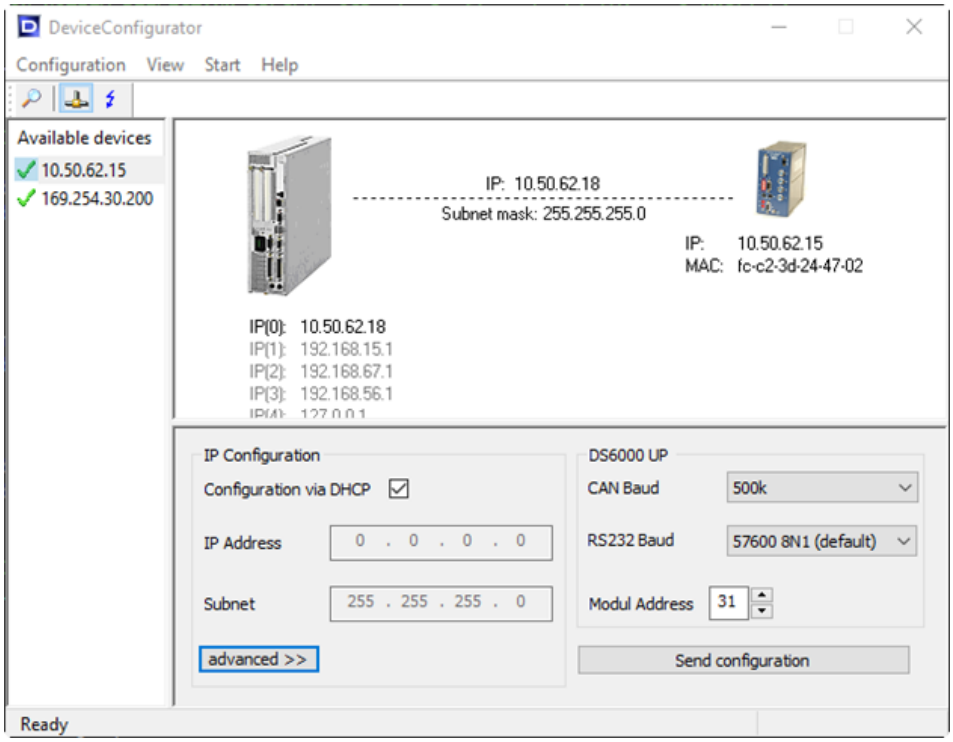
Switch no.	Signal name
SW1	Not used
SW2	CAN Terminator ON/OFF (Factory Setting: OFF)

SW2: The first and the last Module of a module network must be terminated, i.e. switch SW2 of these Modules must be set to ON!

6.5.2 *Perform M600x UP DeviceConfigurator*

6.5.2.1 *Module configuration*

In the M600x UP some of the settings previously available by physical switches are now possible via DeviceConfigurator software tool.
The Dip Switches for CAN BAUD-RATE and RS232 BAUD-RATE and the Rotary Switches for the MODULE ADDRESS are no more present.



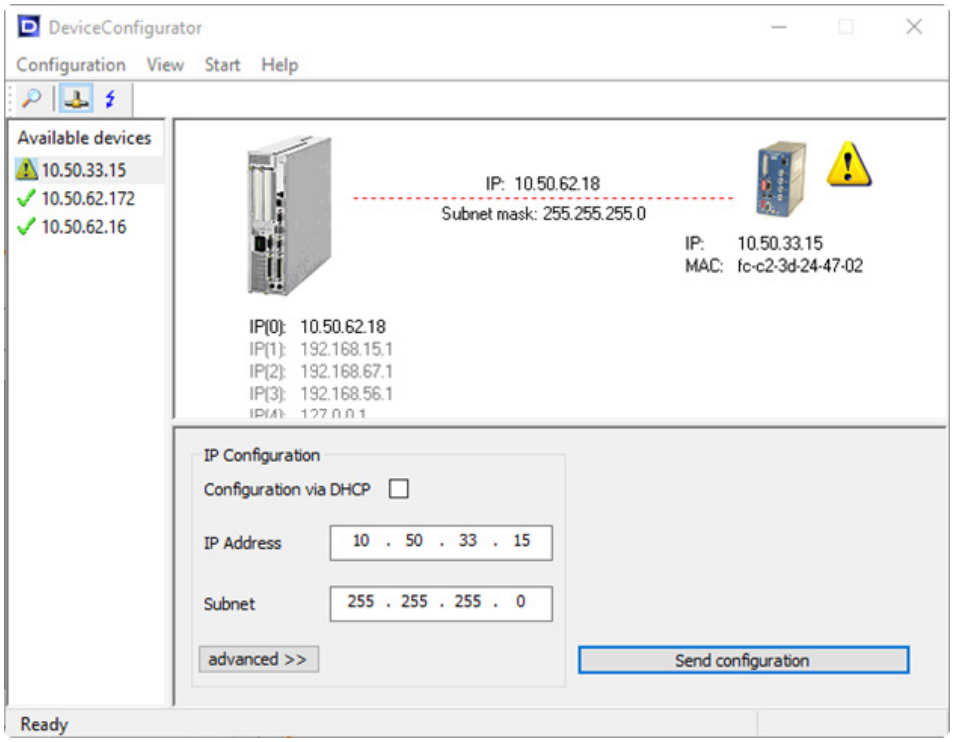
CAN BAUDRATE
All modules in the CAN network must have the same baudrate, the default one is 500K and is also recommended.
- 500K (Default)
- 125K
- 250K
- 1000K

RS232 BAUDRATE
This is for the configuration of the baudrates of the serial interface at the module only. Because the DSCC is in most cases independent of this parameter configured to 576008N1, it is not recommended to change this configuration. It is present because of compatibility issues with former DS6000 modules. The Baudrates of the USER depends on the configuration inside Parameter settings inside DSCC.
- 576008N1 (default)
- 38400 8N1
- 19200 8N1
- (USER)

MODULE ADDRESS
Each Module in the network must have unique module address; the allowed values are 1-99.
The module address is also the address to be selected for Profibus.

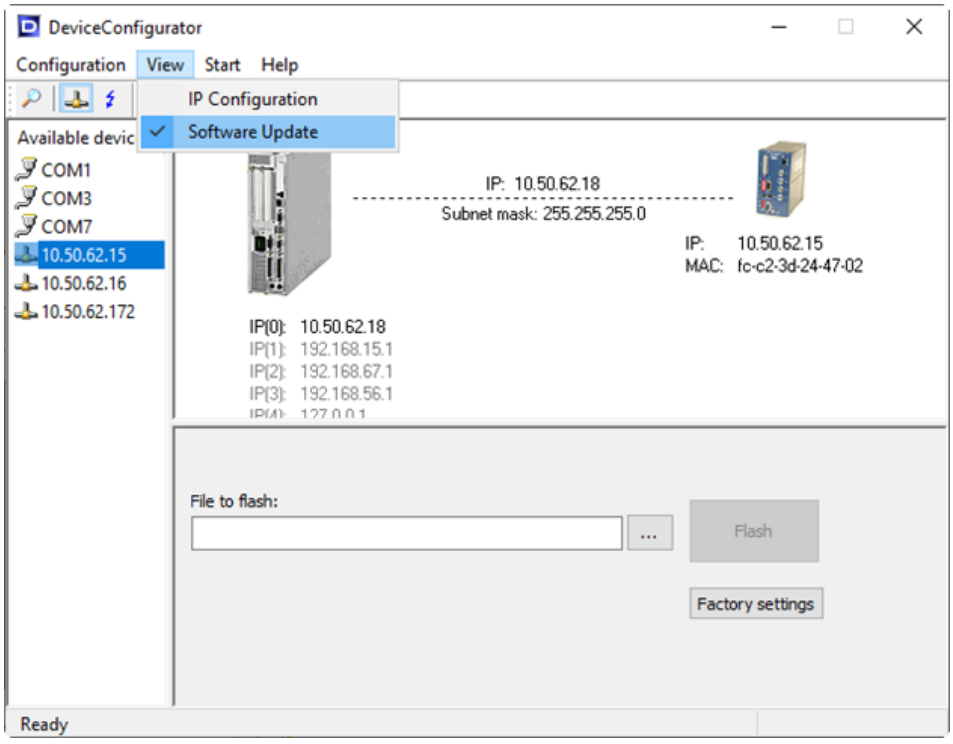
RESTRICTION

The configuration is only possible if the module is detected as a DS6000 UP and in the same subnet of the configurator. Otherwise the group box with the DS6000 UP configuration remains empty:



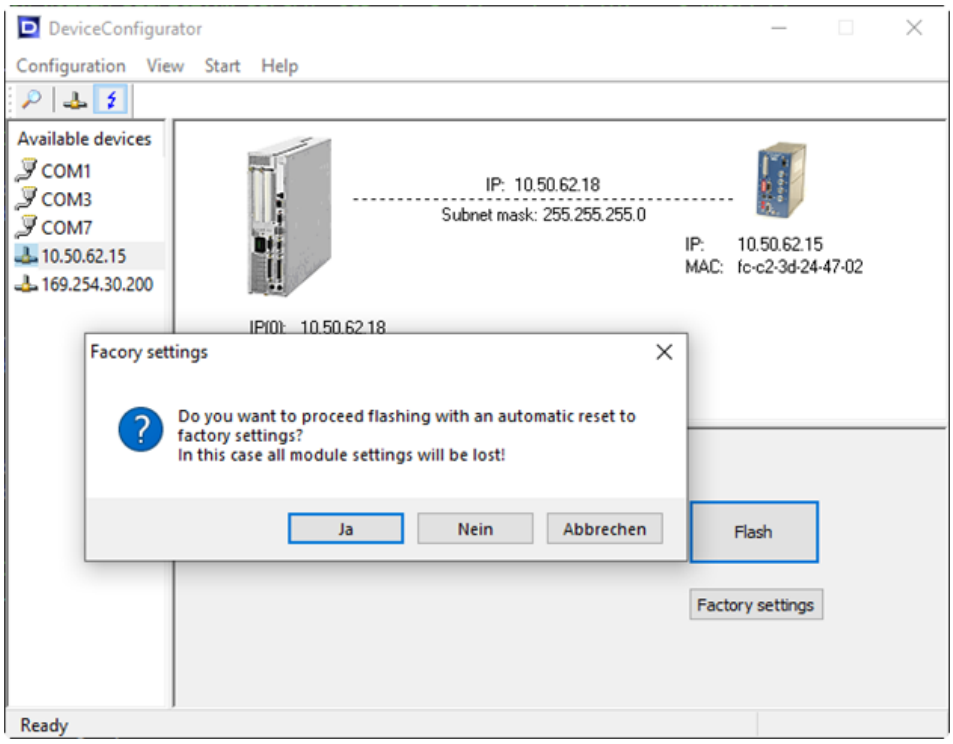
6.5.2.2 *Software Update*

Switch to “Software Update” Screen from Menu (View -> Software Update):



The Software update is easier than on former DS6000 devices, because no DIP-Switches are involved and there is no disconnection/connection of the 24V power supply necessary. The firmware package is an encrypted bin file supplied by Marposs.

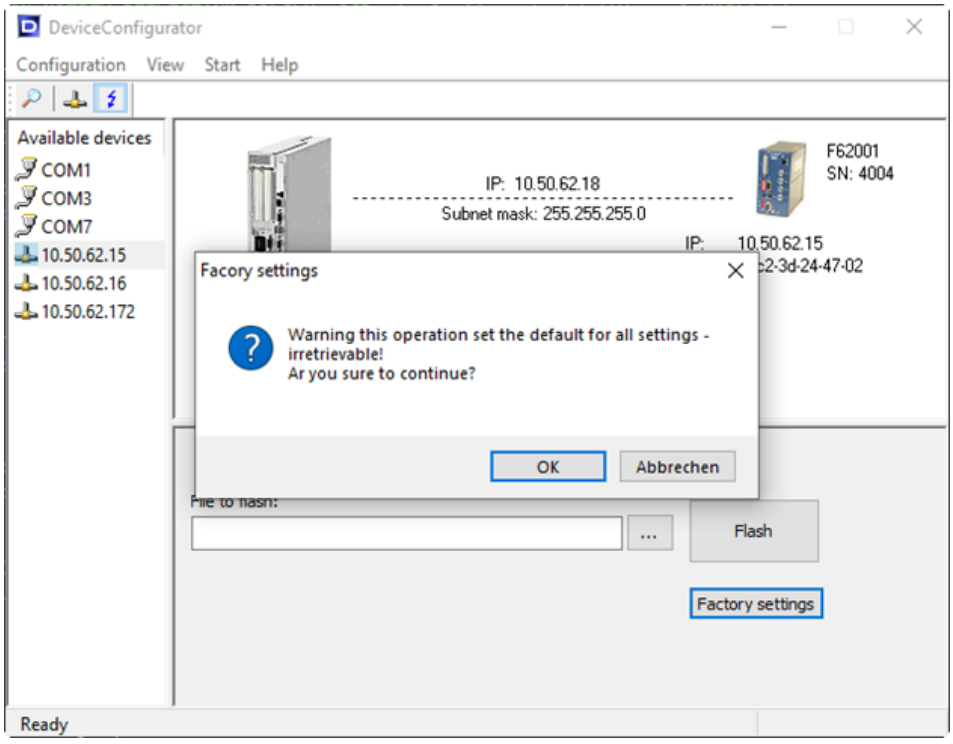
Select Firmware and click on Flash key.



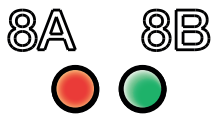
Before the update procedure starts the DSCC requests if you want to perform an additional Factory Reset of the stored settings. This is optional.

6.5.2.3 *Factory Settings*

At former DS6000 modules the factory reset was triggered by a special combination of the rotary encoder and DIP switches. This feature moved now to the Deviceconfigurator as follows:



6.5.3 *LED Displays while operating*



The LEDs 8A and 8B are for PROFIBUS and PROFINET operating status.

ONLY FOR M600X UP MODULES WITH PROFIBUS INTERFACE

LED 8A

Operating Mode		
LED State	**Indication**	**Comments**
Off	Not online / No power	-
Green	Online, data exchange	-
Flashing Green	Online, clear	-
Flashing Red (1 flash)	Parameterization error	-
Flashing Red (2 flashes)	PROFIBUS Configuration error	-

LED 8B

Status		
LED State	**Indication**	**Comments**
Off	Not initialized	-
Green	Initialized	-
Flashing Green	Initialized, diagnostic events(s) present	-
Red	Exception error	-

ONLY FOR M600X UP MODULES WITH PROFINET INTERFACE

LED 8A

Network Status		
LED State	**Indication**	**Comments**
Off	Offline	No power-No connection with IO controller
Green	Online (RUN)	Connection with IO controller established, IO controller in Run state
Green, 1 flash	Online (STOP)	Connection with IO controller established, IO controller in STOP state or IO data bad, IRT synchronization not finished
Green, 3 flashes	Identify	Flashing 3 times (1Hz) continuously to identify slave (DCP_Identify)
Red	Fatal event	Major internal error (this indication is combined with a red module status LED)
Red, 1 flash	Station Name error	Station name not set
Red, 2 flashes	IP address error	IP address not set
Red, 3 flashes	Configuration error	Expected Identification differs from Real identification

LED 8B

Module State		
LED State	**Indication**	**Comments**
Off	Not initialized	No power or Module not ready
Green	Normal Operation	
Green, 1 flash	Diagnostic Event	Diagnostic event(s) present
Red	Exception error or Fatal Event	Modul in exception state or Major internal error (this indication is combined with a red Network Status LED)

The LED 7 is for System monitor status and the LED 4 is for the power status.

LED 7

System monitor		
LED State	**Indication**	**Comments**
Green	System is ok	-
Red	System is not ok (different for AE6000 UP and M600x UP)	for M600x UP: - While in the Function Neutral Position: unsuitable Balancing Head or faulty Balancing Head, and/or speed above 500 rpm. - While in the Function Balancing: • Acceleration Sensor signal is missing and/or • Speed below 300 rpm (if not blanked by a HIGH signal at pin 21 of connector # 2) or above 30,000 rpm, and/or • Short circuited Transmitter Unit and/or • Balancing Time exceeded and/or • Balancing failure.

LED 4

Power		
LED State	**Indication**	**Comments**
OFF	The M600x UP or AE6000 UP Module is not powered by a 24 Vdc source and/or the internal, resettable fuse and/or external fuse (4 Amp) has triggered.	-
ON (light green)	The M600x UP or AE6000 UP Module is ready to operate.	-

N.B.
Except “Balancing Time exceeded”, all failures described above abort the Balancing Function immediately. Simultaneously a System Monitor Failure Signal (LOW signal) is fed through pin 2 of connector # 2 to the machine CNC control or equivalent via PROFIBUS/PROFINET.
If the Balancing Time is exceeded, an additional LOW signal is fed through pin 3 of connector # 2 to the machine CNC control or equivalent via PROFIBUS/PROFINET.

7 DSCC SOFTWARE

7.1 General

7.1.1 Hardware Requirements

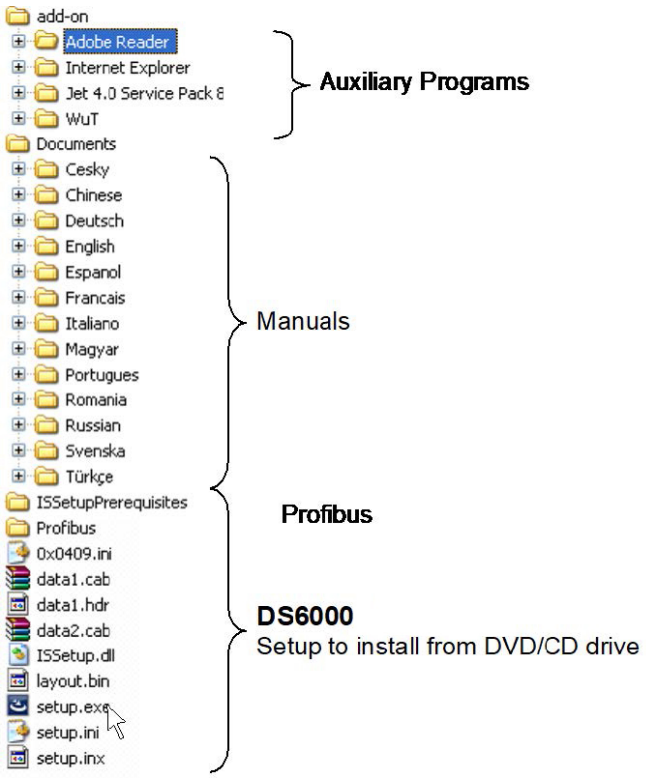
To use the DSCC Software the following hardware is required:
- a PC based Automation System for machine tools (e.g. SINUMERIK®) or a standard Windows® PC with Intel®- or AMD®- Processor and with a hardware equipment corresponding to the operating system,
- a free serial port (RS-232) on the Automation System or computer,
- or an Ethernet interface on the Automation System or computer.

7.1.2 Supported Operating Systems / System Requirements

Operating System	Remarks
Windows® 7	no restriction
Windows® 10	no restriction

Applies to all operating systems:
- TCP/IP-Stack must be installed.
- At least an 8-bit (256 colours) screen display is recommended.
- For the Online Help function a Microsoft Internet Explorer Version 5.x or later is required (refer to the following paragraph).

7.1.3 Directory Structure



7.1.4 *Running set-up program using CD-ROM or DVD*

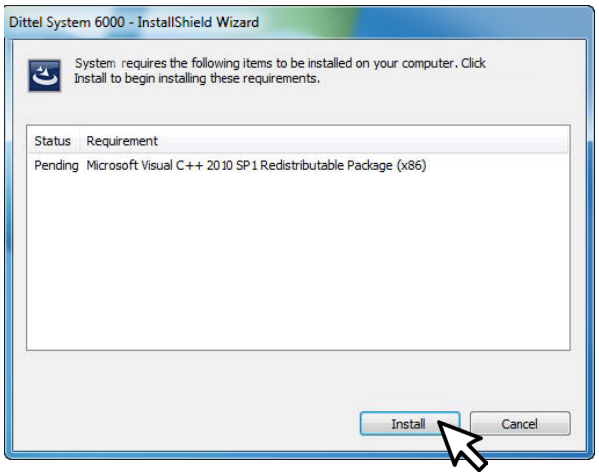
N.B.
Installing the set-up program on Windows® 7 / 10 must be done with administrator rights!

Proceed as follows:
- Insert the DSCC Software CD-ROM or DVD into the respective drive of your Automation System or computer.
- From Windows® start the file manager (e.g. Explorer) and select the appropriate drive.
- Start Setup.exe.
- Continue with running the set-up program as described in the following paragraph.
- If you want to update the program, continue as described in the paragraph “6.6.3 Software Update” on page 55.

7.2 *Software Installation*

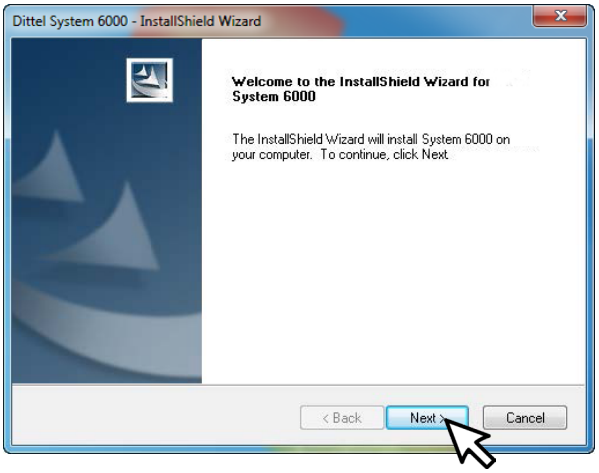
7.2.1 *Standard Windows®*

N.B.
Should the DSCC Software be installed on a SINUMERIK® 840D, skip this chapter and proceed as described in the paragraph “6.6.2.2 SINUMERIK® 840D” on page 51.



If not all prerequisites for installation have been met yet, the opposite dialog will be displayed.

Click on [Install >] to continue.



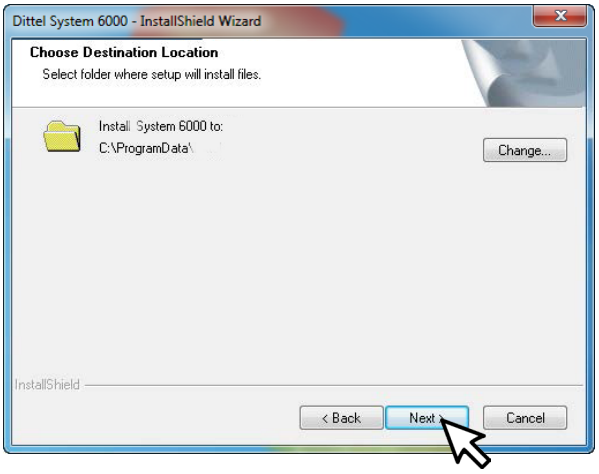
If all prerequisites for installation have been met, a Welcome screen opens after starting the set-up.

Click on [Next >] to continue.

Read the License Agreement thoroughly. If required, the License Agreement can be printed, see key [Print].

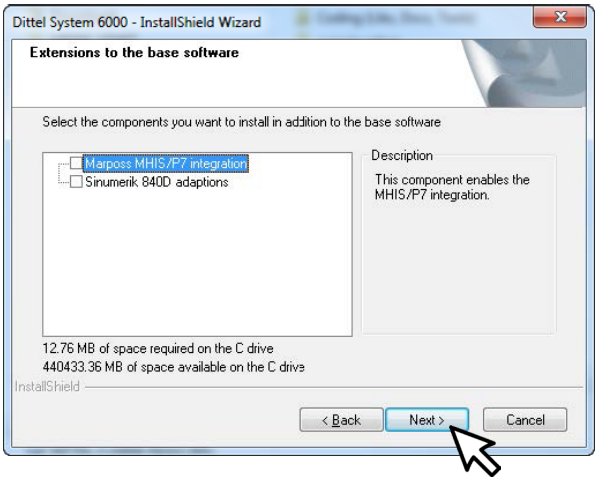
If you accept the License Agreement, click on [Next >].

The installation process will continue.



On the opposite screen select the folder where the set-up will install the files:

It is recommended not to change the path.
Click on [Next >] to continue.



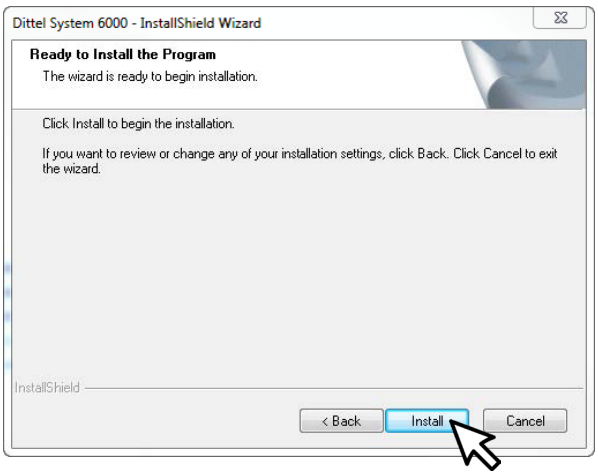
Additionally to the base software the following extensions may be installed:

1) Marposs MHIS/P7 integration.
With this option the Marposs MHIS software is integrated and activated or deactivated.

2) Sinumerik 840D adaptions
This option should NOT be selected when a standard Windows® installation is running.

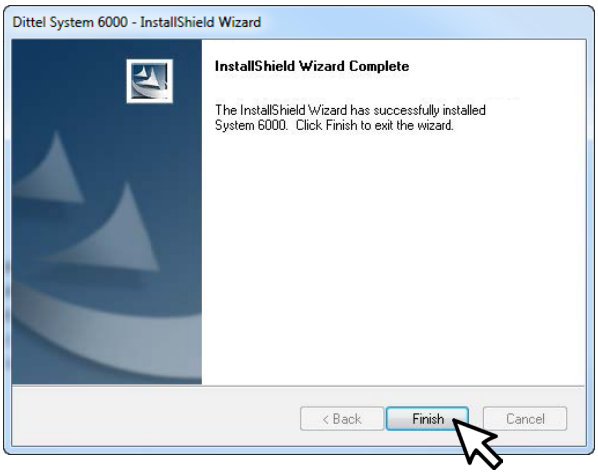
If no extension is highlighted only the base software is installed.

Click on [Next >] to confirm the extension - if any.



The installation starts with the opposite screen:

Click on [Install] to continue.



After successful installation the opposite screen is displayed:

Click on [Finish] to complete the installation of the DSCC Software.

N.B.
WHEN USING Windows® 7 / 10:
If the request for a restart should appear, then it is mandatory that you apply again with the same user name. The installation can be completed successfully only in such a way.

7.2.2 *SINUMERIK® 840D*

The following chapter describes the installation of the DSCC Software on a SINUMERIK® 840D (based on Windows® 7 / 10).

PCU 50

How to start the SINUMERIK® in the Service Mode:

- During the start-up phase of the SINUMERIK® the message “Please select operating system to start” is displayed. Press the [↓] key once.
- Confirm by pressing the yellow [Input] key and the main menu is displayed.
- Select “Standard Windows (Service Mode)” by pressing the [4] key.
- In the following menu select “Standard Windows (without starting SINUMERIK® HMI)” by pressing the [1] key.
- Without operating any key wait till the restart is complete.
- If you are asked for the password, enter <SUNRISE>.
- Run the set-up as described in the paragraph “6.6.1.4 Running set-up program using CD-ROM or DVD” on page 48.

PCU 50.3

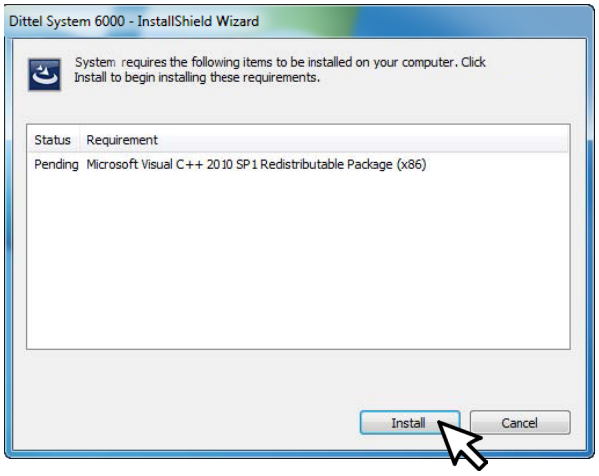
How to start the SINUMERIK® Service-Desktop:

- During the start-up phase of the SINUMERIK® press the [3] key as soon as the Version number is displayed in the lower right corner of the boot screen.
- If you are asked for the password, enter <SUNRISE>.
- In the following menu select “Service-Desktop” or press the [Return] key.
- Run the set-up as described in the paragraph “6.6.1.4 Running set-up program using CD-ROM or DVD” on page 48.

PCU 50.5

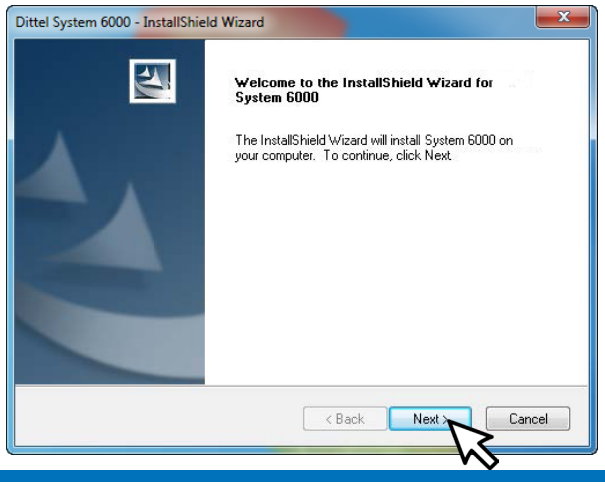
How to start the SINUMERIK® Service-Desktop:

- During the start-up phase of the SINUMERIK® press the [3] key as soon as the Version number is displayed in the lower right corner of the boot screen. Or if a Touch Panel is used, as soon as counted down from 3.
- Login with the administrator account, which was created by installing the PCU Base Software.
- Run the set-up as described in the paragraph “6.6.1.4 Running set-up program using CD-ROM or DVD” on page 48.



If not all prerequisites for installation have been met yet, the opposite dialog will be displayed.

Click on [Install >] to continue.



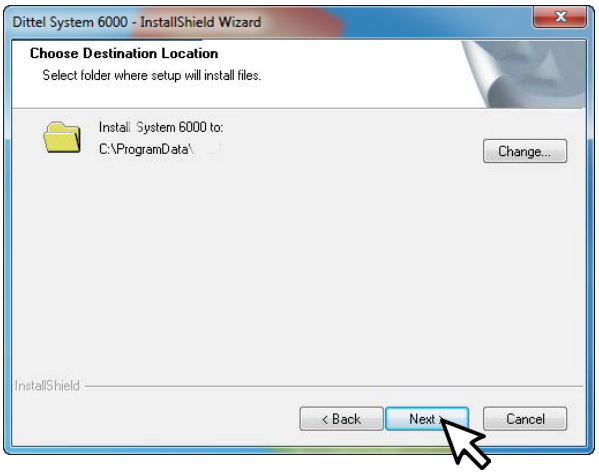
If all prerequisites for installation have been met, a Welcome screen opens after starting the set-up.

Click on [Next >] to continue.

Read the License Agreement thoroughly. If required, the License Agreement can be printed, see key [Print].

If you accept the License Agreement, click on [Next >].

The installation process will continue.

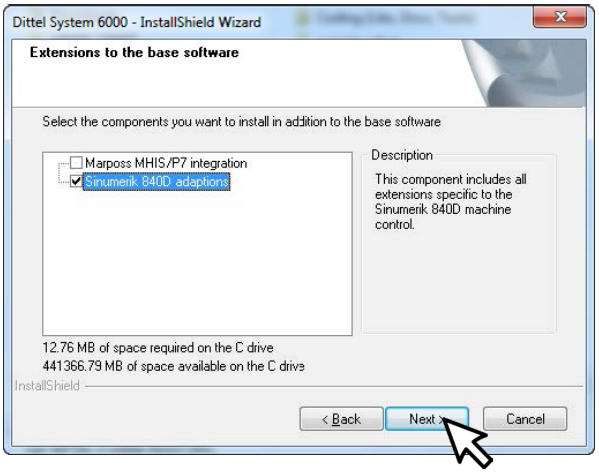


The target directory can be changed in the adjacent screen:

We recommend that you leave the path unchanged.

The following steps relate to the default installation path (see the paragraph “6.6.5.1 Default installation path” on page 57).

Click on [Next >] to continue.

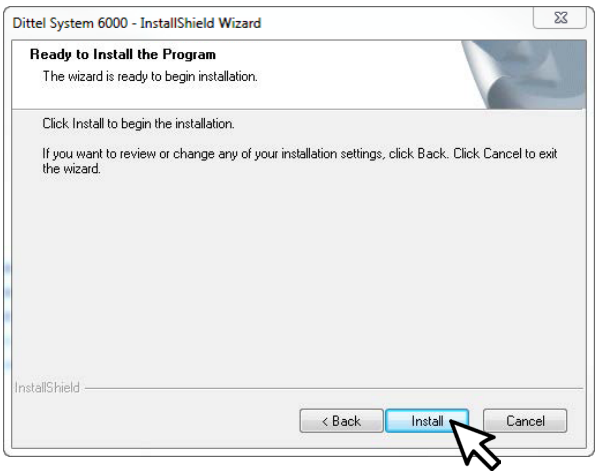


Additionally to the base software the following extensions may be installed:

1) Marposs MHIS/P7 integration.
With this option the Marposs MHIS software is integrated and activated or deactivated.

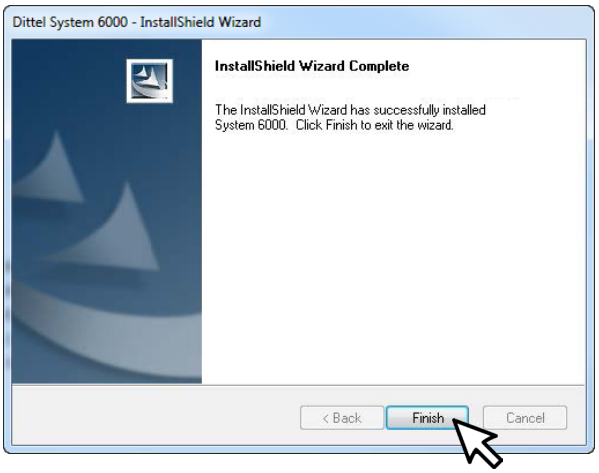
2) Sinumerik 840D adaptions
Make sure this option is selected!

Click on [Next >] to confirm the extension.



The installation starts with the opposite screen:

Click on [Install] to continue.



After successful installation the opposite screen is displayed:

Click on [Finish] to complete the installation of the DSCC Software.

N.B.
WHEN USING Windows® 7 / 10:
If the request for a restart should appear, then it is mandatory that you apply again with the same user name. The installation can be completed successfully only in such a way. In this case start the SINUMERIK® in the “Service Mode” or with the “Service-Desktop” (as described at the beginning of this paragraph).

Now you can generate a softkey for the DSCC Software.

Additionally a directory oem was created in the directory %ALLUSERSPROFILE%\Marposs. Here you will find examples for the integration of the DSCC Software into SINUMERIK® HMI Advanced (regie.ini, oemframe.ini and language\re_xx.ini) or SINUMERIK Operate (systemconfiguration.ini and oemframe.ini).
The paths of the sample files (systemconfiguration.ini and regie.ini) to the executable files scc.exe and sccviewer.exe were adjusted automatically by the Setup.

N.B.
The system environment variable %ALLUSERSPROFILE% depends on the operating system and user settings.
To find out where the directory is actually located, enter the path %ALLUSERSPROFILE%/Marposs in the address bar of Windows® Explorer. Confirm the input with the [Enter] key.

SINUMERIK® HMI Advanced

Copy the files regie.ini, oemframe.ini and language\re_xx.ini into your OEM-directory (e.g. f:\oem) or extend your configuration files according to the example files.

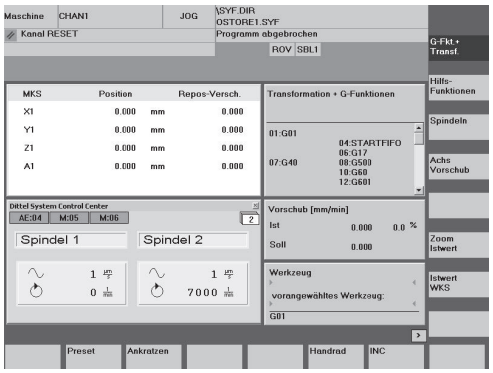
Now you can close the Service Mode or the Service-Desktop and start the Automation System normally. The DSCC Program starts when pressing the appropriate softkey.

N.B.
If only a pre-configured minimum view shall be started and not the complete application the following program arguments are available when calling the program “sccviewer” (see example file Regie.ini):
Task10 = name := oemframe, cmdline := “f:\\oem\\DS6000 UP\\sccviewer.exe /mode:start 0,400 220x140 /layer 1 /autohide”, Timeout := 6000, WindowName := “Marposs System viewer”, HeaderOnTop := FALSE, Preload:=TRUE
Please note: it may be necessary to adjust the path to the SCC.exe and the sccviewer.exe in the file regie.ini..

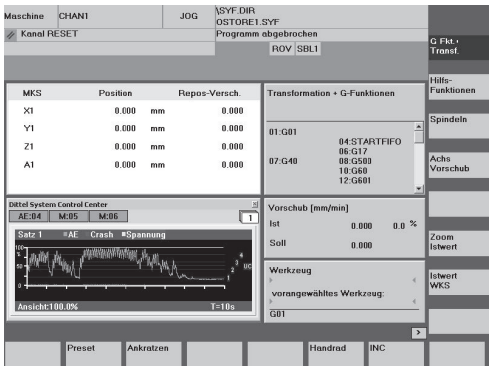
In the example /mode:start 0,400 220x140 /layer 1 /autohide

0,400	x/y Position of window (related to the coordinate origin (0/0) in the upper left screen corner)
220x140	Width and height of window
/layer 1	Program starts with Display Layer 1
/autohide	When the operating area ‘MACHINE’ is left, then the view is blanked automatically. In this context, it is useful to set the parameter ‘Preload’ to ‘TRUE’ (see above). Through this the program is started automatically when starting the machine control. Without this option, the view is always visible on a fixed display position (even when the operating area MACHINE is not selected).

Example:
Balancing
Module
M600x UP



Example:
AE-Module
AE6000 UP



N.B.
The full-screen mode and the minimum view mode are using the same interface settings. If one of these applications is already active and the second application is started additionally, the first application closes automatically to release the occupied interface.

SINUMERIK Operate

Copy the file systemconfiguration.ini into your User or OEM-directory (e.g. f:\oem).
• <Sinumerik_Operate_Installationspfad>/user/sinumerik/hmi/cfg
• <Sinumerik_Operate_Installationspfad>/oem/sinumerik/hmi/cfg or extend your configuration files according to the example files.

Copy the file oemframe.ini into your directory <Sinumerik_Operate_Installationspfad>/compat/user/oem
or extend an existing configuration file of the same name according to the example files.

Now you can close the Service Mode or the Service-Desktop and start the Automation System normally. The DSCC Program starts when pressing the appropriate softkey.

N.B.
In the systemconfiguration.ini find examples how the Marposs System Viewer can be embedded in „Sinumerik Operate“.

Key shortcuts SCC.ex sccviewer.exe

[Ctrl] + [1] … [9]
selects the Display Layer 1 to 9 directly provided that the keyboard focus is set to that application (either particularly by computer mouse or by softkey “Marposs System viewer”)

[Ctrl] + [End]
exits the application “sccviewer” (it does not matter if the keyboard focus is set to that application or not).

7.3 *Software Update*

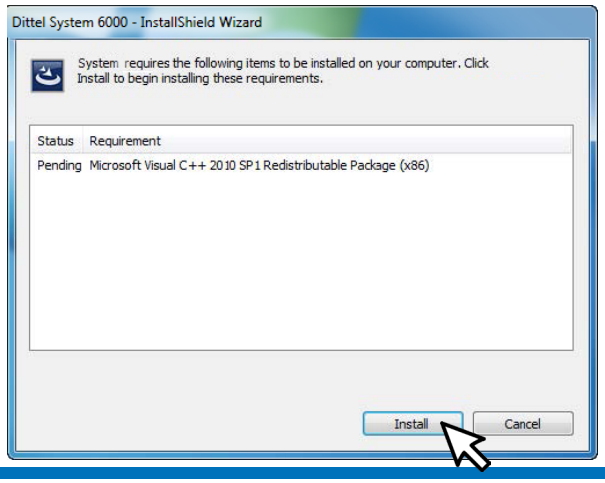
Due to improvements and extensions like functions, languages, operation, etc. but also corrections, it may be necessary to update your DSCC Software.

7.3.1 *Changing the Installation Directory*

If you run an update from a version earlier than 3.60, follow the instructions in the paragraph “6.6.2 Software Installation” on page 48. Your data are retained and imported into the new version.
Please note that from Version 3.60 on a change of the installation path took place. Now, the DSCC software is located at %ALLUSERSPROFILE%\Marposs, where the environment variable is resolved differently depending on the operating system and any adjustments (see paragraph “6.6.5.1 Default installation path” on page 57”).
Under Windows® 7 / 10 the resolved path is called by default C:\ProgramData\Marposs.

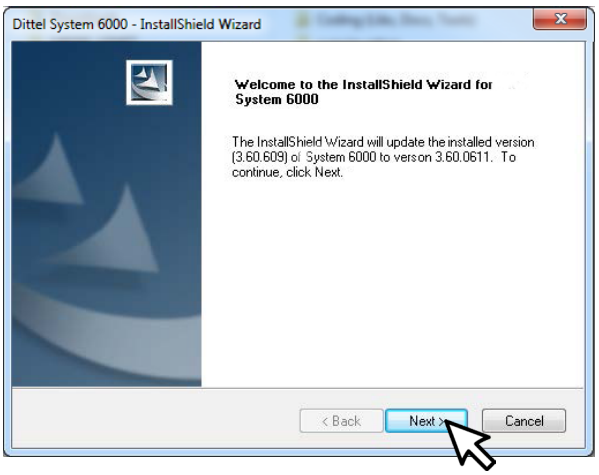
Proceed as follows:

Close the current DSCC Software on your Automation System or Computer, if applicable.
Install the new software version from the CD/DVD considering the instructions given in paragraph “6.6.1.4 Running set-up program using CD-ROM or DVD” on page 48.
Start the program Setup.exe by double-clicking.



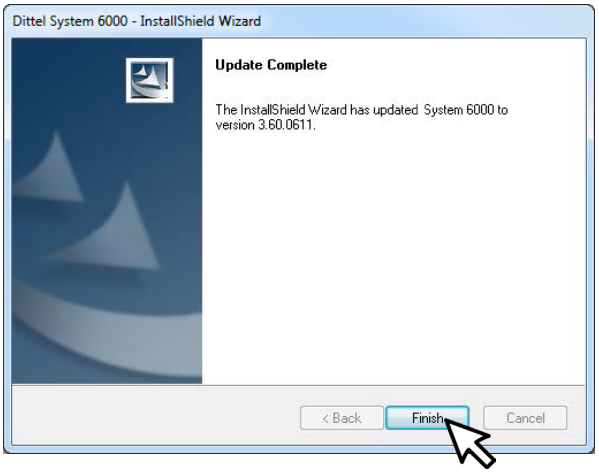
If not all prerequisites for installation have been met yet, the opposite dialog will be displayed.

Click on [Install >] to continue.



The program creates the InstallShield.

Click on [Next >] to update the DSCC.



The new version of the DSCC Software will overwrite the present version. All settings like Sets, Limits, Offset, etc. remain unchanged.

To complete the Update click on [Finish].

Start the program as usual.

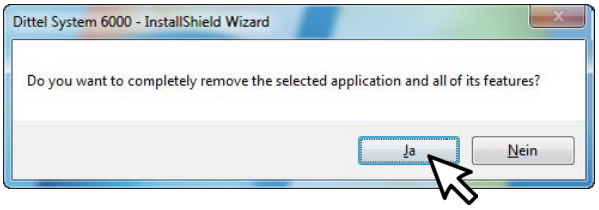
7.4 *Delete the DSCC Software*

The DSCC Software can be deleted completely from your computer or Automation System using the Windows® Control Panel.

Proceed as follows:

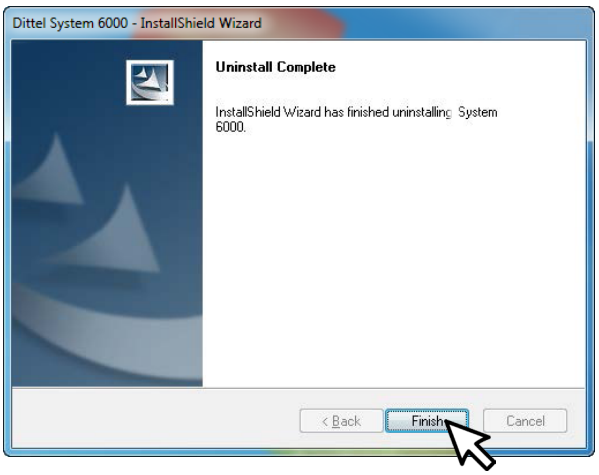
If applicable, close the current DSCC Program.

Windows® 7: Open the folder Programs and Functions via Start / (Settings) / Control Panel.
Windows® 10: Open the folder Programs and Features via Start / (Settings) / Control Panel.
In the list, highlight the line Marposs System 6000 and click on Change (Add) / Remove.



A dialog box opens and asks “Do you want to completely remove the selected application and all of its features?”.

Confirm the uninstallation by clicking on [Yes].



The DSCC Software will be deleted.

Also a system reboot may be necessary. Choose if you want to reboot your computer now or later.

Complete the uninstallation by clicking on [Finish].

If the uninstallation program gives the message that files could not be removed completely, delete the remaining files in the folder Marposs System 6000 with the help of the Windows® Explorer.

7.5 *Further information*

7.5.1 *Default installation path*

The default installation path for the DSCC software is %ALLUSERSPROFILE%\Marposs.

N.B.
%ALLUSERSPROFILE% is a system environment variable and depends on the operating system and user settings. To determine the precise location of the directory, enter the path %ALLUSERSPROFILE%\Marposs in the Windows® Explorer address line and press [Enter] to confirm. Windows® then automatically replaces the placeholder with the full path, which you can read in the Explorer address line.

Example Under Windows® 7 / 10 the full default path is C:\ProgramData\Marposs.

7.5.2 *Command line options*

You can run the SCC.exe and sccviewer.exe programs using command line options. The text file command-line.txt in the <Install_path>\ctrl\help\ directory contains an overview of the available command line options.

7.5.3 *Keyboard shortcuts*

You can control the SCC.exe and sccviewer.exe programs using keyboard shortcuts. The text file keyboard-shortcuts.txt in the <Install_path>\ctrl\help\ directory contains an overview of the the available keyboard shortcuts.

8 DSCC GENERAL SETTINGS

8.1 *Starting the Program*

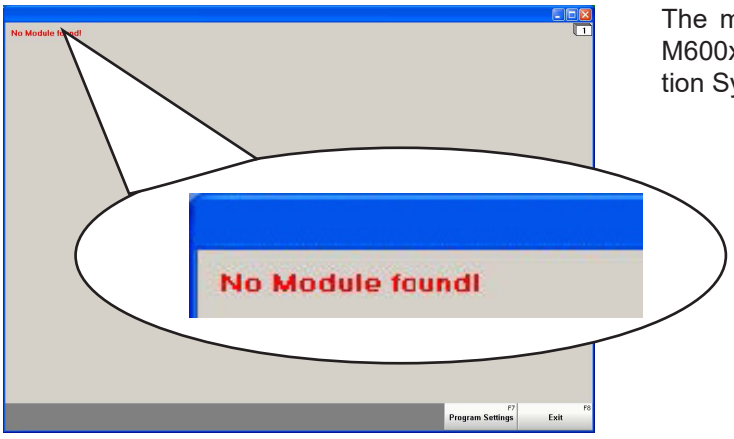
Start the Program on your Automation System or computer by clicking on button Start and then on symbol “Dittel System Control Center”.

Or start the Program by clicking on buttons Start / Programs / Dittel System 6000 and finally on the symbol “Dittel System Control Center”.

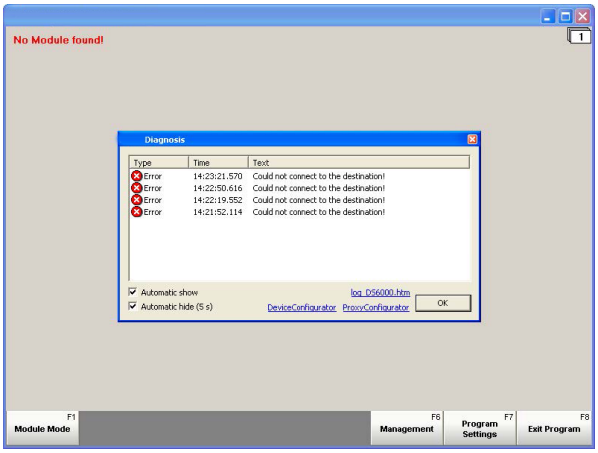
In the SINUMERIK® HMI-Environment you can start the “DSCC Program” by pressing the appropriate softkey.

N.B.
A new installed DSCC Software always starts in the English language!
These ‚General Settings’, particularly the RS-232 interface communication to the Automation System, can only be carried out with operational DS6000 UP Module(s)!

When starting the DSCC Software the very first time the following start screen should open:

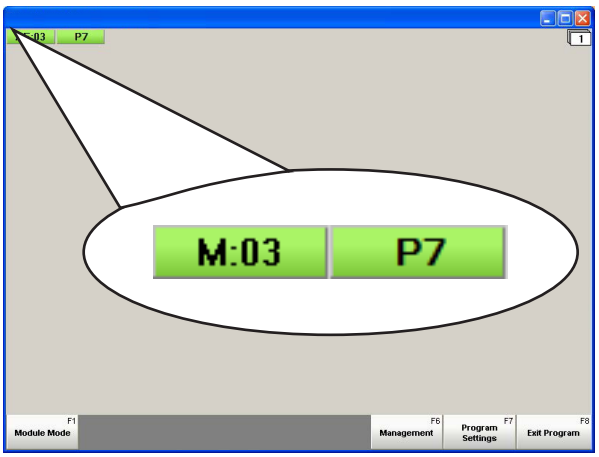


The message “No Module found!” appears since the Module M600x UP cannot communicate with the Computer or Automation System yet.



After some seconds, the notice ‘Error Could not connect to the destination’ is displayed repeatedly.

Ignore this notice by clicking on [OK] key or pressing the [Enter] key on the PC keyboard or [Input] on the SINUMERIK® keypad to continue.



With an interface already configured once the following start screen of the module should open:

In this example a MARPOSS Module P7 and a MARPOSS Module for electromechanical balancing, M600x UP with the address M:03, are connected to the Automation System or Computer.

To set a different language of the screen, the access levels and the communication between your PC or Automation System and Module the following General Settings have to be carried out.

N.B.
For integration of MARPOSS MHIS software and operation of the MARPOSS module P7, see Appendix A and documentation regarding MHIS software and P7 hardware.

8.1.1 *Requirements to configure the RS-232 interface*

The DSCC Software with Software Version V 3.00 or later is installed on your Windows®-based Automation System or on your Standard Windows® computer with appropriate hardware equipment.

One Module is connected via a serial interface cable to an available RS-232 Port of your Automation System or computer.

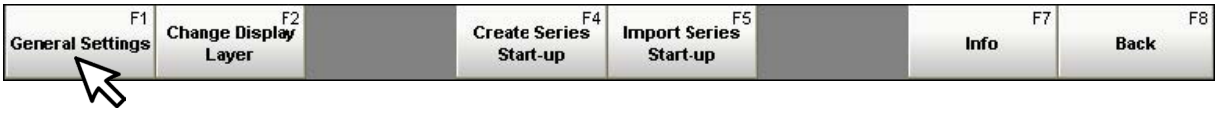
All DS6000 UP Modules are connected to a suitable 24 Vdc power source (all green LEDs # 4 light).

Several DS6000 UP Modules are connected with each other by special patch cords A/N O67L0020018, formerly A/N K0020018 (connectors # 9 or # 10), the first and last Module is terminated (DIP-switch # 6, switch SW2 to „ON“).

8.2 *General Settings*

To configure the DSCC Program press or click on the [Program Settings] key or the function key [F7).

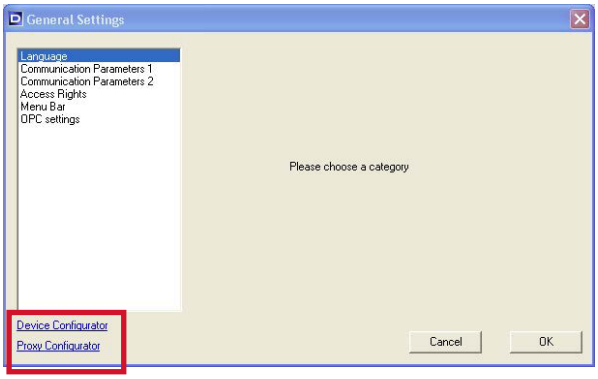
Then click or press on the [General Settings] key or function key [F1].



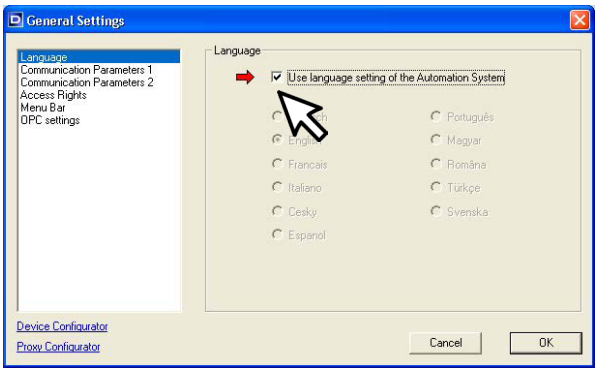
N.B.
If the Proxy Service was installed additionally while installing or updating the DSCC Software to version V 2.20 or later the shortcut to the Proxy Configurator is displayed at the lower left corner on the screen. The Device Configurator is installed automatically when installing or updating the DSCC Software to version V 2.30 or later.

The following screen should open.

8.2.1 *General Settings: Language*

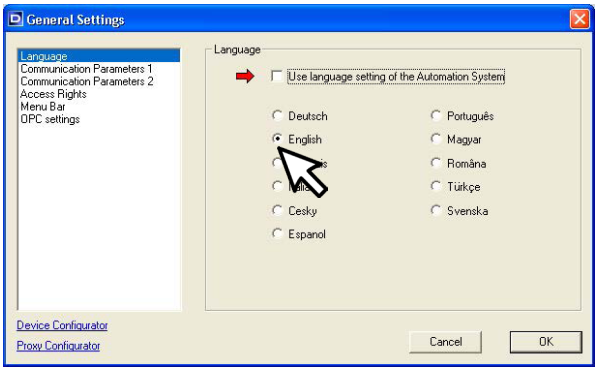


Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] or Down- [▼] softkey or the function key [F1] or [F2] highlight the wanted Category. To open the options display press the softkey [Select] or function key [F6].	Click on the wanted Category.



Use language setting of the Automation System
Only in combination with an Automation System and installed OPC Server!
Notice the OPC settings!
If this function is activated (check box active), the DSCC Software takes over the language setting of the Automation System.

Operation using softkeys/ function keys:	Operation using computer mouse:
With the [+] / [-] softkeys or the function keys [F3] / [F4] activate or deactivate the function.	Click into the check box to activate or deactivate the function.



Manual Language setting

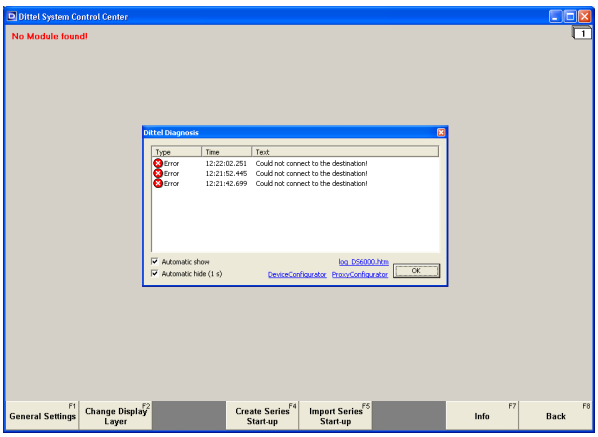
Factory setting: **English**,
can be set to German, English, French, Italian, Czech, Spanish, Portuguese, Hungarian, Romanian, Turkish or Swedish.
Additional languages on request.

With the [+] / [-] softkeys or the function keys [F3] / [F4] highlight the wanted **Language**, in this case English.	Click on the wanted **Language**, in this case English.

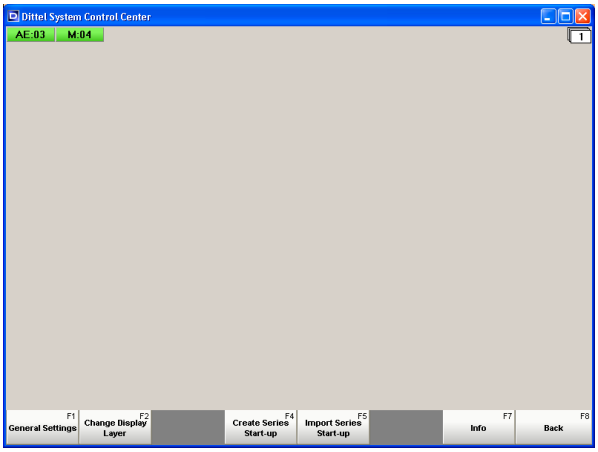
N.B.
Confirm a change in **Language** by clicking on the [OK] key or pressing the [OK] softkey or function key [F8]. The following screen opens in the selected language.

Press or click the [Back to General Settings] / [F5] key and you return without any change to select another **General Setting**.

Press or click the [Cancel] / [F7] key and you return without any change to the English start screen.

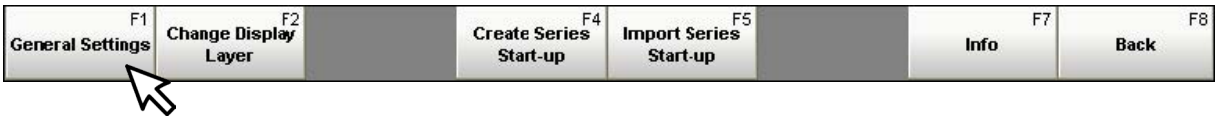


After you have selected and confirmed the language, you return to the opposite screen.
If the RS-232 Interface of the Module is not configured yet the notice **Error Could not connect to the destination** can be displayed repeated.
Ignore this notice by clicking on [OK] key or pressing the [Enter] key on the PC keyboard or [Input] on the SINUMERIK® keypad to continue.
The softkeys and messages have changed into the new language, if applicable.



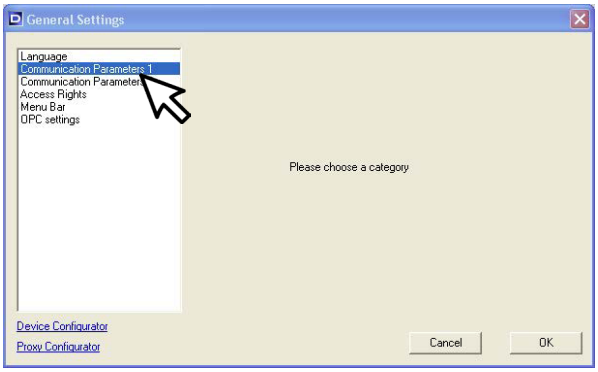
With configured interface and operational DS6000 UP Modules, the screen will show green Module addresses.

To continue click or press on the [General Settings] key or function key [F1].

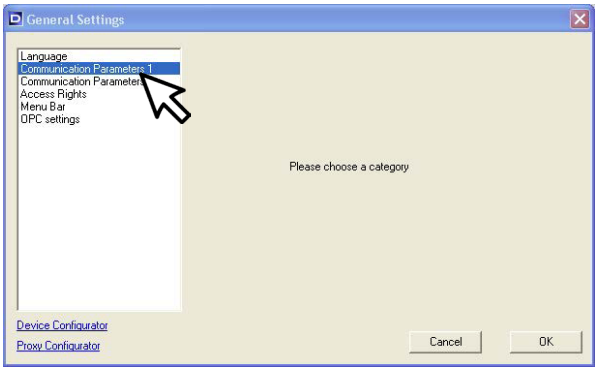


8.2.2 *General Settings: Communication Parameters 1*

N.B.
For Ethernet Interface, see supplementary document «Ethernet Interface, article number ODNDL03EN03».



Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] or Down- [▼] softkey or the function keys [F1] / [F2] highlight the Category **Communication Parameters 1**. To open the options display press the softkey [Select] or function key [F6].	Click on Category **Communication Parameters 1**.

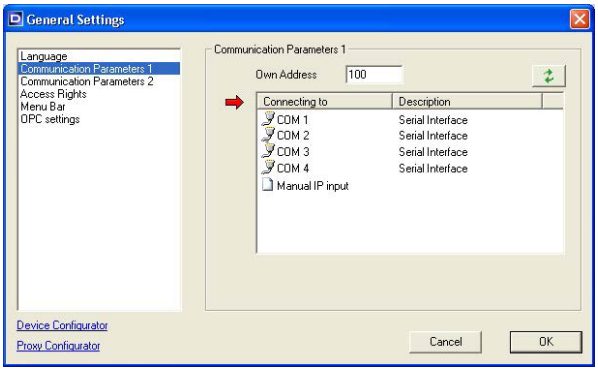


Own Address
Factory setting: **100**,
variable from 100 to 109.

The address setting 100 is intended for the Operator PC or the Automation System. Only with this address, automatic data configuration is possible.

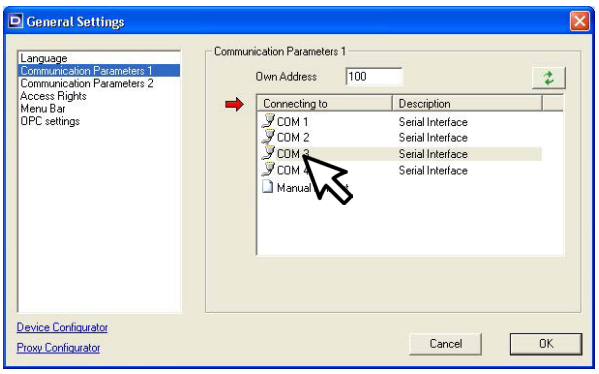
Enter an address higher than 100 when you want to configure the System externally via a Notebook etc. Then the functionality is restricted.

With the [+] or [-] softkey or function keys [F3] / [F4] enter the wanted address.	Click into the address screen, highlight numbers, and enter the wanted address. Or click on [+] or [-] keys to increase or decrease the address.



As soon as Category **Communication Parameters 1** is opened, the DSCC Software is searching for available interfaces of your Computer or Automation System.

With the Up- [▲] / [F1] or Down-softkey [▼] / [F2] set the red arrow to «Connecting to».



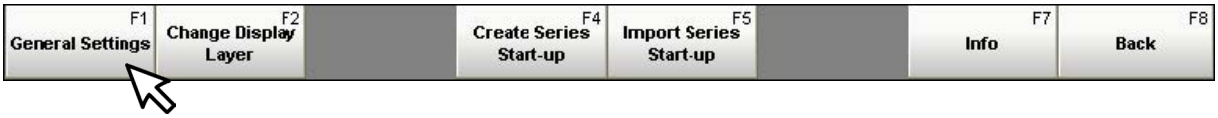
With the mouse cursor or with the [+] / [F3] or [-] / [F4] softkey highlight the Serial Interface of your Computer or Automation System which is connected via a RS-232 Interface cable to a DS6000 UP Module.

When using an Automation System SINUMERIK®, COM1 is always internally occupied, that means, you have to set the Serial Interface to COM2 or higher.

N.B.
Confirm the setting in **Communication Parameters 1** by clicking on the key [OK] or pressing the softkey [OK] or function key [F8]. Communication is done with a Standard Baud Rate of **57600**. After successful connection to the module, the screen with green Module addresses will appear.

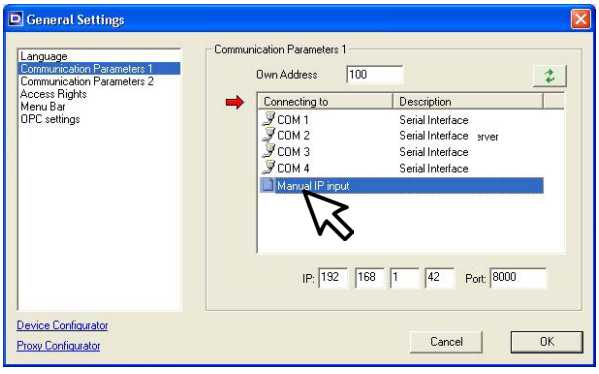
Press or click the key [Back to General Settings] / [F5] and you return without any change to select a new **General Setting**.

To continue click or press on the [General Settings] key or function key [F1].



Setting the IP Address of an Ethernet Interface Converter

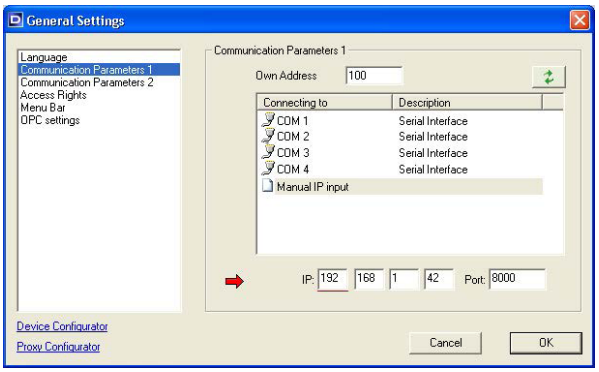
This settings are required when the DS6000 UP Module(s) should be operated via an external interface converter (serial / Ethernet) with an Ethernet interface of your computer or Automation System. IP-address and TCP-Port must be set corresponding to your interface converter:



Manual IP input

Operation using softkeys/function keys:	Operation using computer mouse:
With the Down-softkey [▼] set the red arrow to Connecting to. With the [+] or [-] softkey highlight **Manual IP input**.	With the mouse cursor click on '**Manual IP input**'.

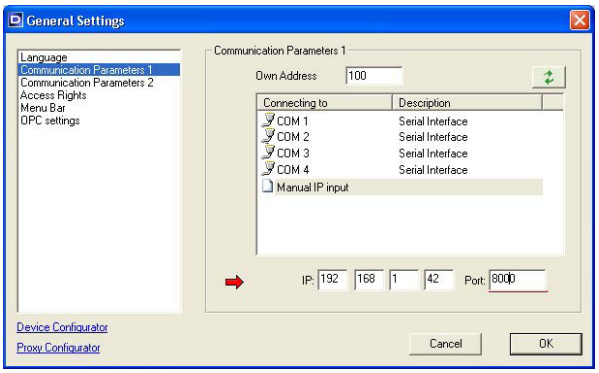
Additional screens open:



IP Address

Factory setting: **192 168 1 42**

With the Down-softkey [▼] set the red arrow to IP. The first screen is underscored red. With the [+] or [-] softkey set the wanted IP-Address. With the Down-softkey [▼] underscore the second screen, set the next numbers using the [+] or [-] softkeys and so on.	Click or highlight each screen and type the wanted IP Address or use the [+] or [-] keys.



Port

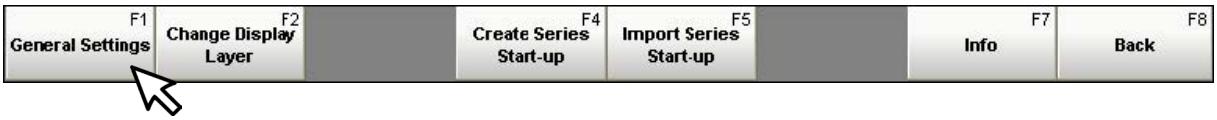
Factory setting: 8000

Operation using softkeys/function keys:	Operation using computer mouse:
With the Down-softkey [▼] highlight the window Port. With the [+] or [-] softkey set the wanted TCP Port number.	Click or highlight the window and type the wanted TCP Port or use the [+] or [-] keys.

N.B.
Confirm a change in **Communication Parameters 1** by clicking on the [OK] key or pressing the [OK] softkey / function key [F8]. After successful connection to the module the screen with green Module addresses will appear.

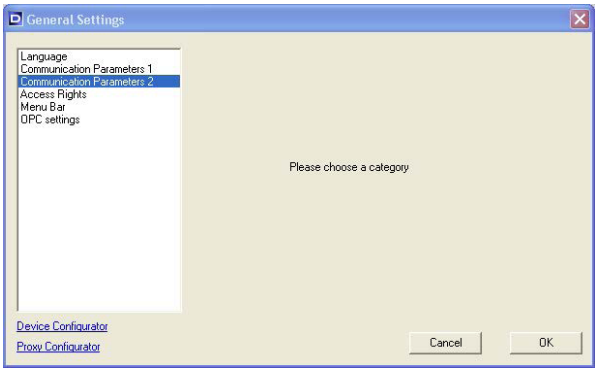
Press or click the key [Back to General Settings] / [F5] and you return without any change to select a new **General Setting**.
Clicking or pressing the [Cancel] / [F7] key returns you without any change to the screen that will show green Module addresses.

To continue click or press on the [General Settings] key or function key [F1].



8.2.3 *General Settings: Communication Parameters 2*

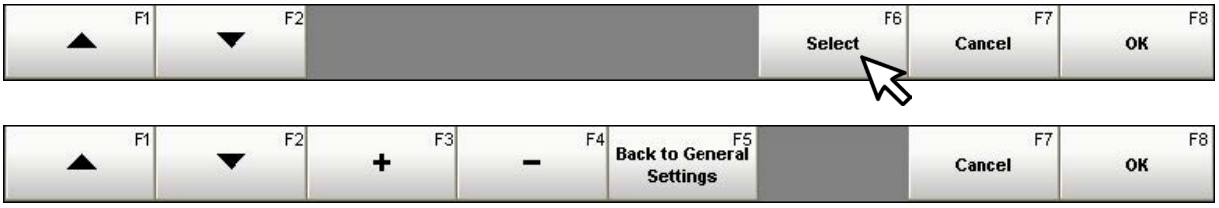
N.B.
This setting is intended for future use, please DO NOT activate!
An activation of this function may cause an error message and no connection to the module can be made!



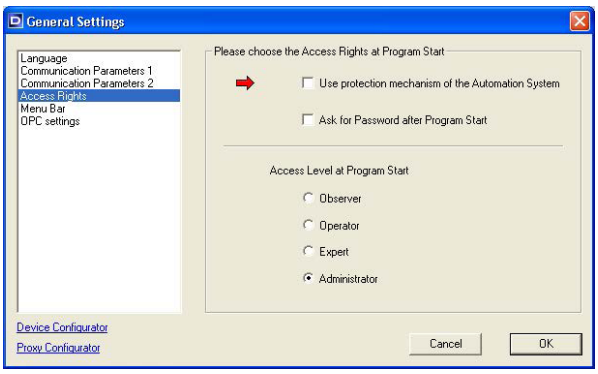
8.2.4 *General Settings: Access Rights*

N.B.
Ex-factory the DSCC Software is shipped with Access Level 'Administrator' and without password.
We recommend not restricting the Access Rights as long as the DS6000 UP Modules are not running properly on the machine tool!

Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] or Down- [▼] softkey highlight the category **Access Rights**. To open the options display press the softkey [Select] / [F6].	Click on the category **Access Rights**.



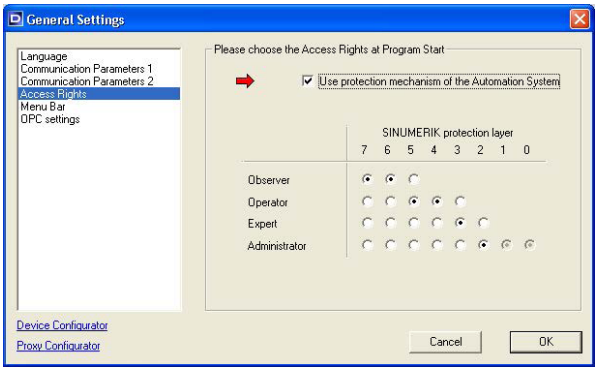
N.B.
The following setting applies only in combination with an Automation System and installed OPC Server!
Notice the OPC settings!



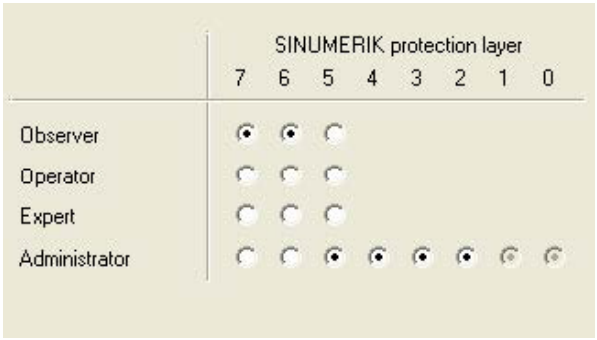
Use protection mechanism of the Automation System

Factory setting: ☐ (not active).

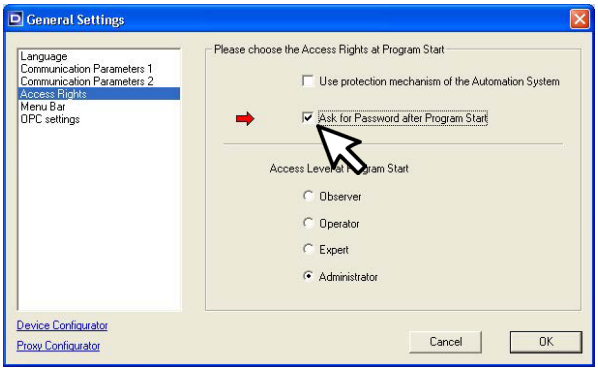
Can be set to ☐ (non-active) or ☑ (active).
With this function, the used protection layers of the Automation System are transferred to the DS6000 UP Modules.



Operation using softkeys/function keys:	Operation using computer mouse:
With the [+] / [F3] or [-] / [F4] key activate or deactivate the function. When activated the following setup screen opens.	Click into the check box and activate or deactivate the function. When activated the following setup screen opens.



For example, the operation and programs of the SINUMERIK® Automation System are protected internally via a 7-stage access mode, in which ‘0’ indicates the highest and ‘7’ the lowest access level.
With the Up- [▲] / [F1] or Down- [▼] / [F2] key and the [+] / [F3] or [-] / [F4] key activate the desired access levels. Or click into the respective check boxes.
When starting the DSCC software the program starts always with the access level predefined by the Automation System. While operating the actual access level of the Automation System determines the access level of the DS6000 UP Modules according the opposite setting.

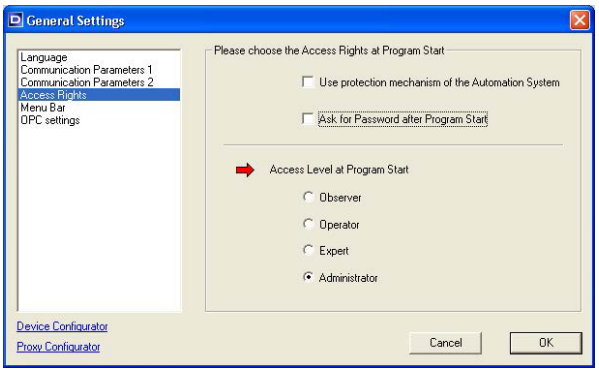


Ask for Password after Program Start

Factory setting: ☐ (not active), no password stored.

Can be set to ☐ (non-active) or ☑ (active).
If this function is active, a password for the selected access level must be entered when starting the program (see next setting).
If this function is not active then the program starts immediately without password in the selected access level.

Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the setting **Ask for Password after Program Start**. With the [+] / [F3] or [-] / [F4] key activate or deactivate the password prompt.	Click into the check box and activate or deactivate the password prompt.



Access Level at Program Start

Factory setting: **Administrator**.
With this setting adjustments or operation can be limited, depending on the access level. Nevertheless, if the Administrator wants to access the program, it is possible any time after entering the valid password.

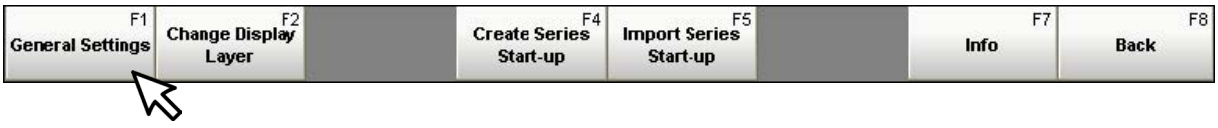
Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the setting **Access Level at Program Start**. With the [+] / [F3] or [-] / [F4] key set the wanted Access Level at Program Start	Click into the check box to set the wanted **Access Level at Program Start**.

M600x UP:

Observer: Only observation of the Balancing process possible. Control is done solely by external machine commands.
Operator: Like Observer, additionally authorized to select the memory sets, manual balancing and to Start or Stop Automatic Balancing.
Expert: Like Operator, additionally authorized to set or change the memory sets and to perform Auto Setup of the Balancing Module.
Administrator: No restriction, full range of operation and setting.

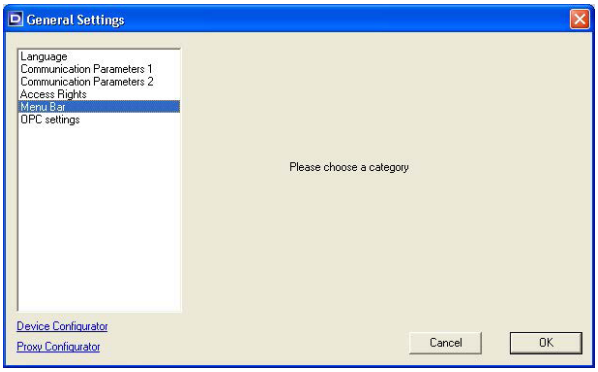
N.B.
Confirm a change in Access Rights by clicking on the [OK] key or pressing the [OK] softkey or function key [F8]. You return to the green screen.
Press or click the [Back to General Settings] / [F5] key and you return without any change to select a new General Setting.
Pressing or clicking the [Cancel] / [F7] key returns you without any change to the green screen.

To continue click or press on the [General Settings] key or function key [F1].

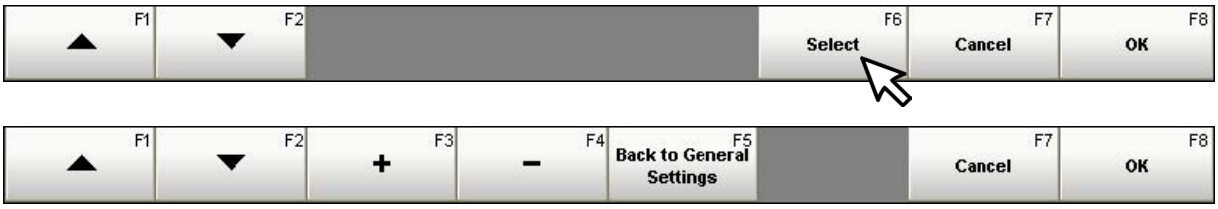


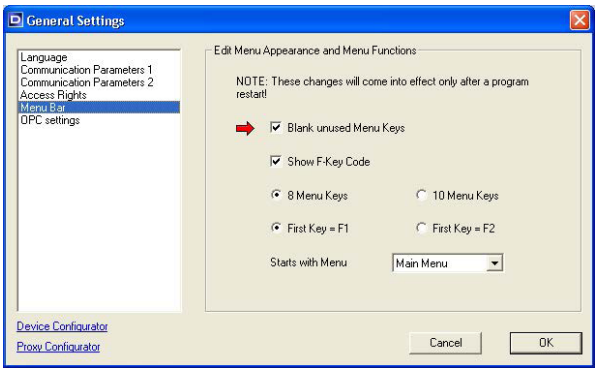
8.2.5 *General Settings: Menu Bar*

N.B.
The following settings get effective only after a restart of the DSCC software!



Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the category Menu Bar. To open the options display press the softkey [Select] or [F6].	Click on the category **Menu Bar**.





Blank unused Menu Keys

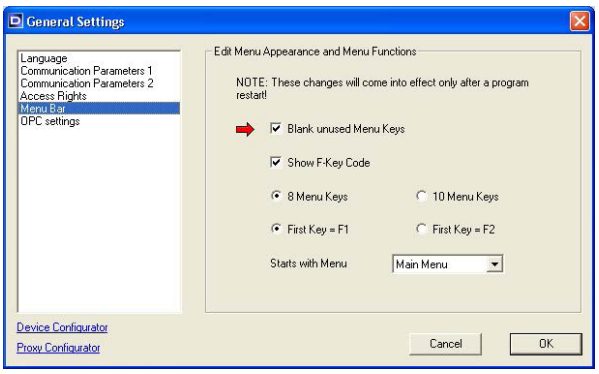
Factory setting: ☑ (active).

Can be set to ☐ (non-active) or ☑ (active).
With this setting, unused menu keys are either blanked or visible.

With the [+] / [F3] or [-] / [F4] key activate or deactivate the function.	Click into the check box and activate or deactivate the function.

Setting: ☑ **Blank unused Menu Keys**

Setting: ☐ **Blank unused Menu Keys**



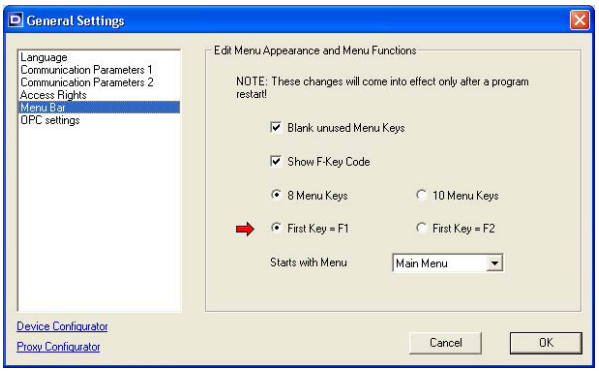
8 Menu Keys - 10 Menu Keys

Factory setting: **8 Menu Keys**.
Can be set to **8 Menu Keys or 10 Menu Keys**.
With this setting, you can adapt the number of menu keys (softkeys) to the number of keys at the Automation System.

With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the line **8 Menu Keys - 10 Menu Keys**. With the [+] / [F3] or [-] / [F4] key determine the number of menu keys.	Determine the number of menu keys by clicking into the appropriate check box.

Setting: **8 Menu Keys**

Setting: **10 Menu Keys**

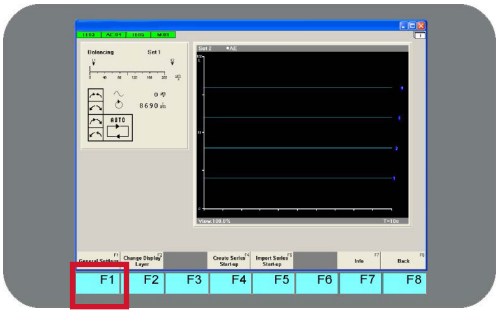


First Key = F1 – First Key = F2

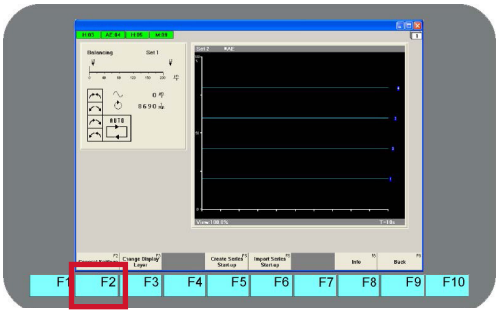
Factory setting: **First Key = F1**.
Can be set to **First Key = F1** or **First Key = F2**.
If the **F1-Key** is occupied yet, e.g. for the HELP function, the first softkey can be set as **F2-Key**.
All function keys described in this operator's manual apply to the setting **First Key = F1**!

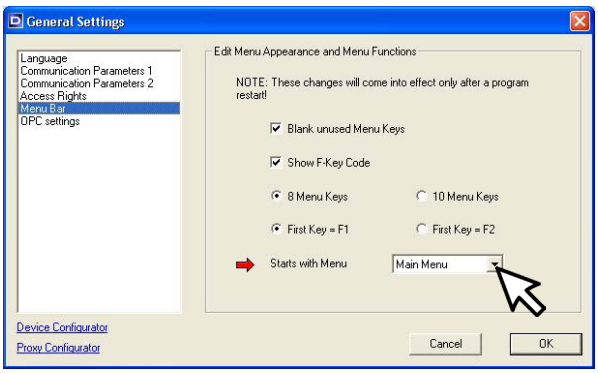
Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the line **First Key = F1 – First Key = F2**. With the [+] / [F3] or [-] / [F4] key determine the appropriate setting.	Determine the setting by clicking into the appropriate check box.

Setting: **First Key = F1**



Setting: **First Key = F2**

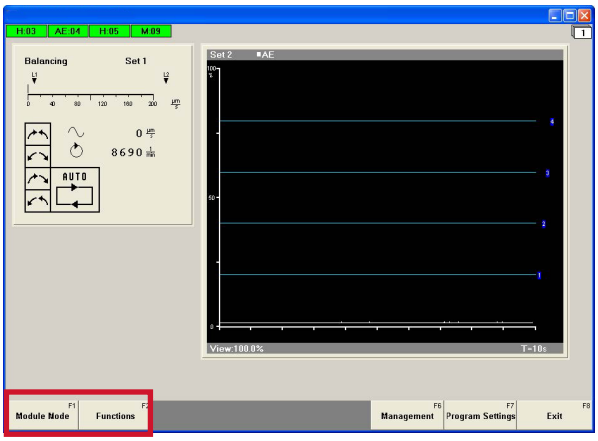




Starts with Menu

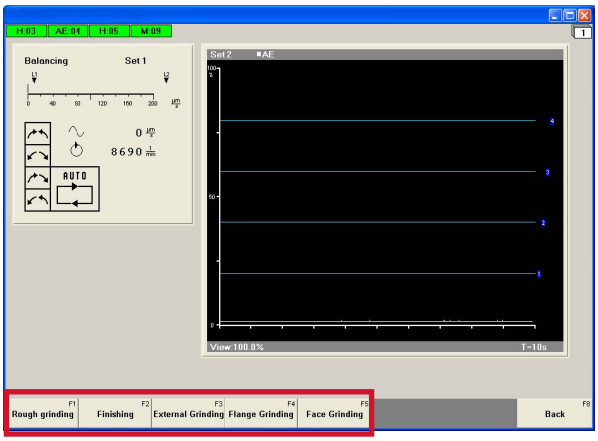
Factory setting: **Main Menu**.
Can be set to **Main Menu** or Functions.
With this setting, you can determine with which menu the DSCC software starts.

Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the line Starts with Menu. With the [+] / [F3] or [-] / [F4] key determine the Starts with Menu.	Click on the wanted Starts with Menu.



Program starts with setting **Main Menu**

The additional key [Functions] is only available when new menu keys were defined in the menu **Management - Setup Functions**.

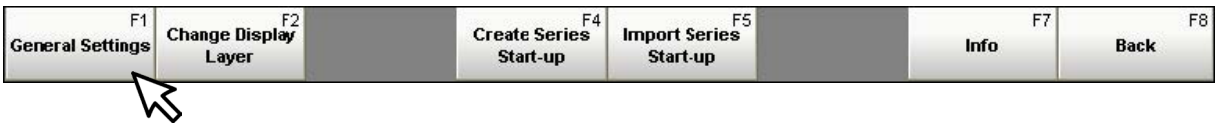


Program starts with setting **Functions**

The program starts with the keys defined in the menu **Management - Setup Functions**.
In this example the keys are defined as ‘Rough grinding’, ‘Finishing’, ‘External Grinding’, etc.

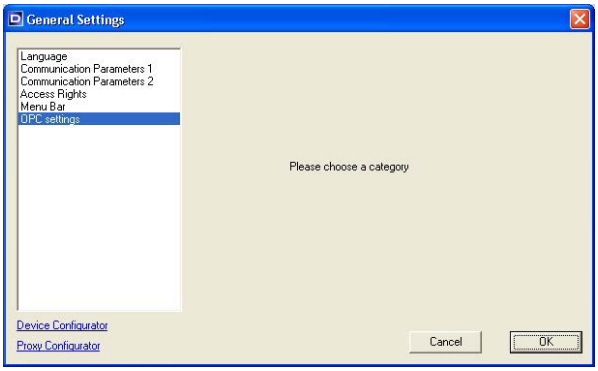
N.B.
Confirm a change in **Menu Bar** by clicking on the [OK] key or pressing the [OK] softkey or function key [F8]. You return to the green screen.
Exit the DSCC software and restart it, only then the changes get effective!
Press or click the [Back to General Settings] / [F5] key and you return without any change to select a new **General Setting**.
Pressing or clicking the [Cancel] / [F7] key returns you without any change to the green screen.

To continue click or press on the [General Settings] key or function key [F1].

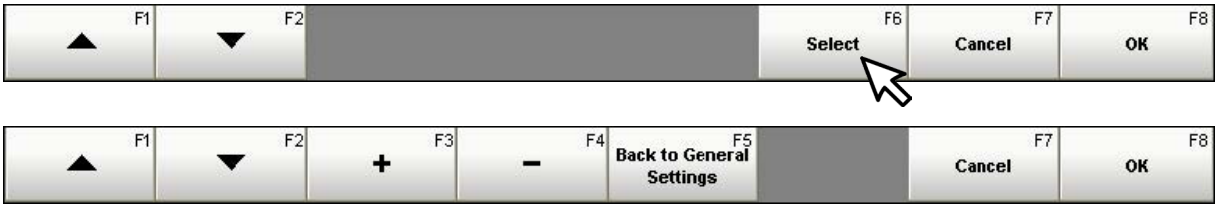


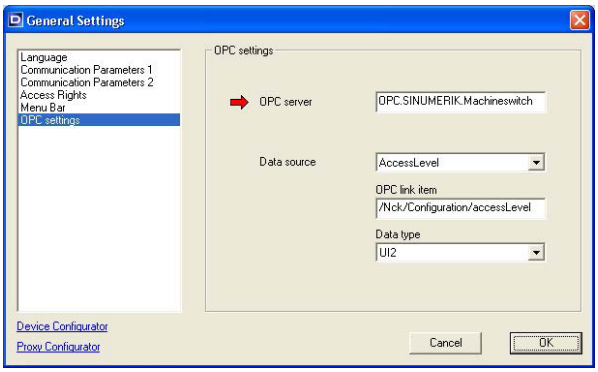
8.2.6 *General Settings: OPC Settings*

N.B.
An OPC Server software must be installed on your Automation System!



Operation using softkeys/function keys:	Operation using computer mouse:
With the Up- [▲] / [F1] or Down- [▼] / [F2] key highlight the category **OPC Settings**. To open the options display press the soft-key [Select] or [F6].	Click on the category **OPC Settings**.





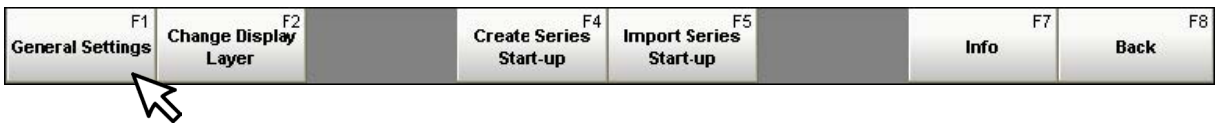
OPC Server

Factory setting: OPC.SINUMERIK.Machineswitch

For more information, please contact our Sales Department.

N.B.
Confirm a change in **OPC Settings** by clicking on the [OK] key or pressing the [OK] softkey or function key [F8]. You return to the green screen.
Press or click the [Back to General Settings] / [F5] key and you return without any change to select a new **General Setting**.
Pressing or clicking the [Cancel] / [F7] key returns you without any change to the green screen.

To continue click or press on the [General Settings] key or function key [F1].



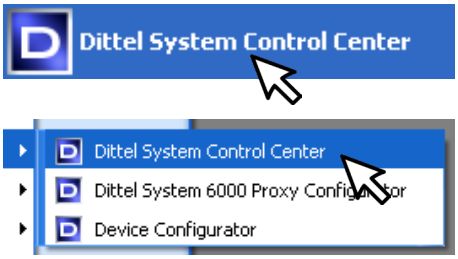
9 MODULE SPECIFIC SETTINGS

9.1 Precondition

a) One pre-set Balancing Module M600x UP is
- connected to a 24 Vdc power source (green LED # 4 lights),
- connected to an Automation System (e.g. SINUMERIK®) or Standard-Windows® Computer with appropriate hardware equipment via the Serial Interface (RS-232), connector # 5, or via Ethernet.
- The DSCC Program is properly installed (refer to paragraph “6.6 DSCC Software” on page 47) and the interface configured (see paragraph “6.7.2.2 General Settings: Communication Parameters 1” on page 62). For Ethernet interface, see Supplementary Document “Ethernet Interface” A/N ODNDL03EN03.

b) Several pre-set Balancing Modules M600x UP and/or Process Monitoring Modules AE6000 UP are:
- connected to a 24 Vdc power source (all green LEDs # 4 light),
- connected with each other by special Patch Cords (A/N O67L0020018, formerly A/N K0020018), the first and last Module is terminated (DIP-switch # 6 is ON).
- ONE Module must be connected to an Automation System (e.g. SINUMERIK®) or Standard-Windows® Computer with appropriate hardware equipment via the serial interface (RS-232) or via Ethernet. The interface of THIS Module is appropriately configured (see paragraph “6.7.2.2 General Settings: Communication Parameters 1” on page 62 for RS-232, for Ethernet see Supplementary Document A/N ODNDL03EN03).
- The DSCC Software is properly installed and the interface configured (refer to paragraph “6.6 DSCC Software” on page 47).

9.2 Starting the Program



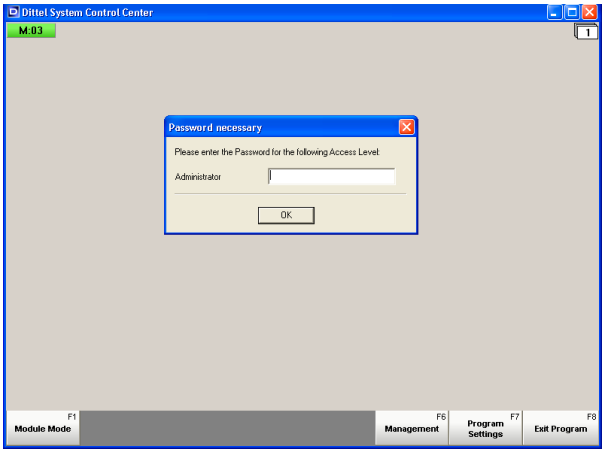
Start the Program on your Automation System or computer by clicking on button Start and then on symbol “Dittel System Control Center”.

or start the Program by clicking on buttons Start / Programs / Dittel System 6000 and finally on the symbol “Dittel System Control Center”.

In the SINUMERIK® HMI-Environment, you can start the DSCC Program by pressing the appropriate softkey.

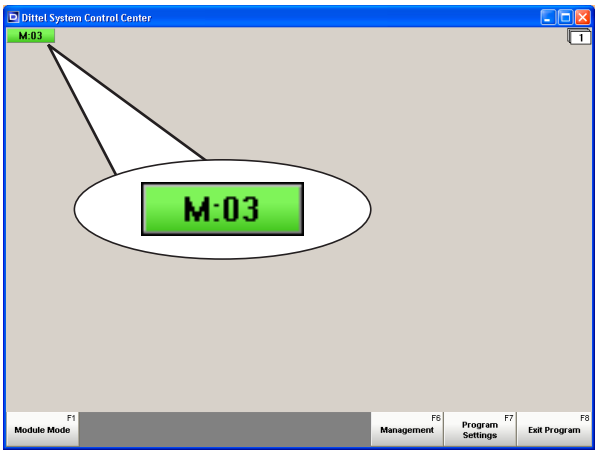
The following Start Screen should open:

9.2.6.1 Start Screen

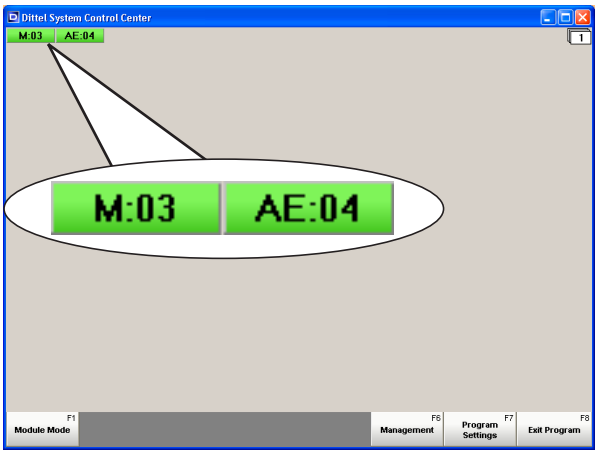


When the password prompt is activated (see paragraph “6.7.2.4 General Settings: Access Rights” on page 65) the opposite screen is displayed.
If no password has been entered till now, click on [OK] or press [Enter] on your computer keyboard or [Input] on the SINUMERIK® keypad.
Otherwise enter your password and click on [OK] or press [Enter] on your computer keyboard or [Input] on the SINUMERIK® keypad.

When the password prompt is not activated or you have confirmed by clicking on [OK] or pressing [Enter] / [Input] the following start screen is displayed depending on number of connected Modules:



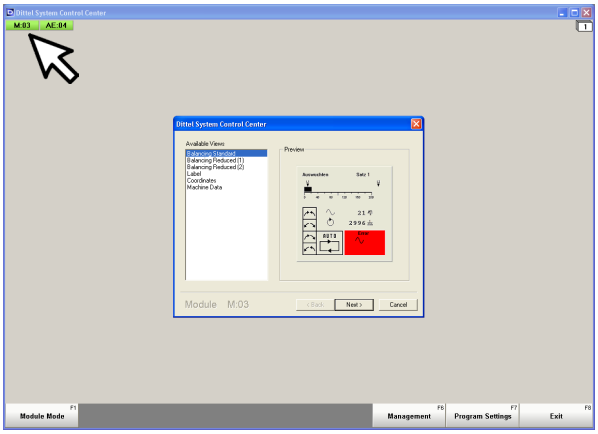
A green Module Address **M:03** shows a ready to operate M600x UP Balancing Module with the address 03.



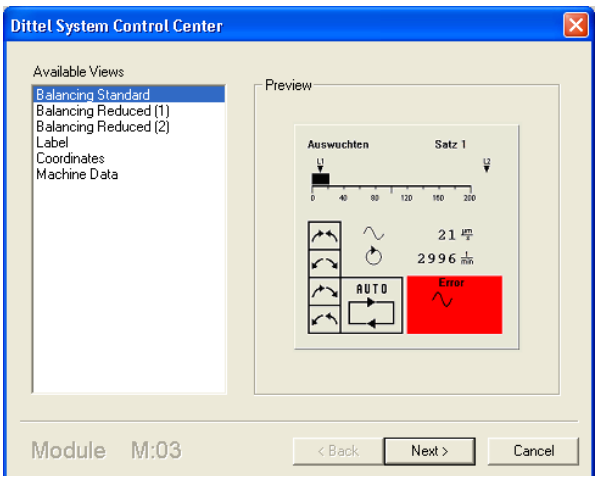
Green Module Addresses **M:03 AE:04** show two ready to operate Modules; one M600x UP Balancing Module with the address 03, and one AE6000 Process Monitoring Module with the address 04.

9.2.1 *Activating the Module(s)*

N.B.
Without the following settings, an M600x UP Balancing Module is not operable via an Automation System or PC! Each Module must be 'visible' at least on one of the Display Layers!



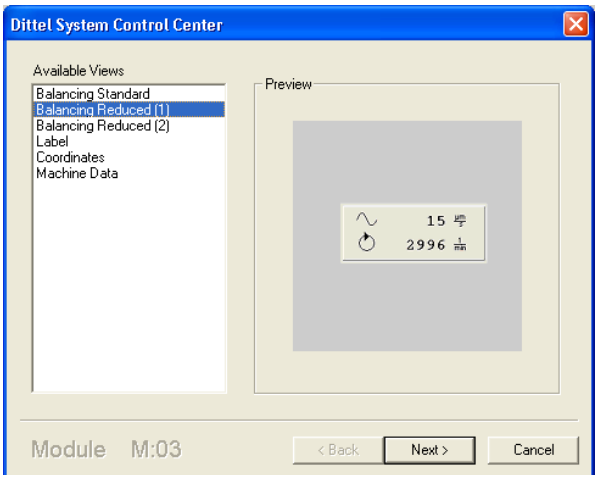
Activate a Balancing Module by double-clicking, for example on Module Address **M:03**. The opposite options display opens. There are five different Module Views available to represent the Balancing Module M600x UP on the screen. The preview shows you examples.



Balancing Standard

The View “Balancing Standard” shows a complete Balancing screen, which is **NOT** scalable.
It shows

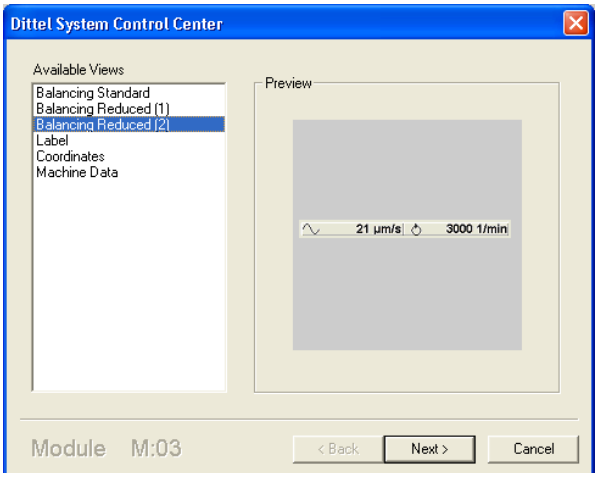
- Set-Number,
- Unbalance in digits and as bar graph,
- Revolutions per minute,
- Limits,
- Operating mode,
- Error messages.



Balancing Reduced (1)

The View “Balancing Reduced (1)” shows only the Unbalance in digits and speed in revolutions per minute in a non-scalable screen.
All other balancing functions occur in the background; no error messages are displayed on the screen.

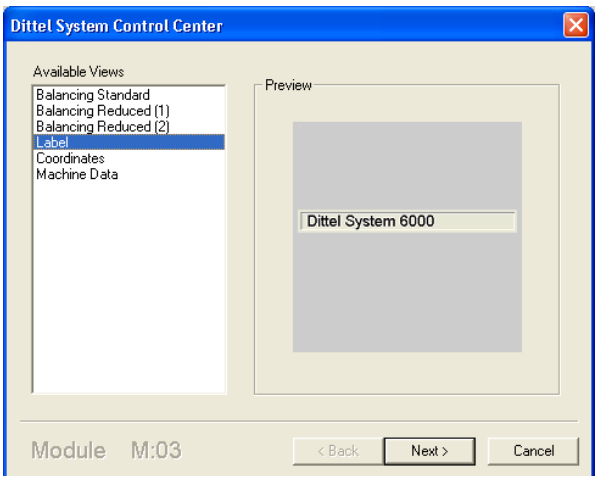
In this View the Balancing Module M600x UP is fully able to work. All balancing functions occur in the background; no error messages are displayed on the screen!



Balancing Reduced (2)

The View “Balancing Reduced (2)” shows the Unbalance in digits and the speed in revolutions per minute in a fully scalable screen.
All other balancing functions occur in the background; no Error messages are displayed on the screen.

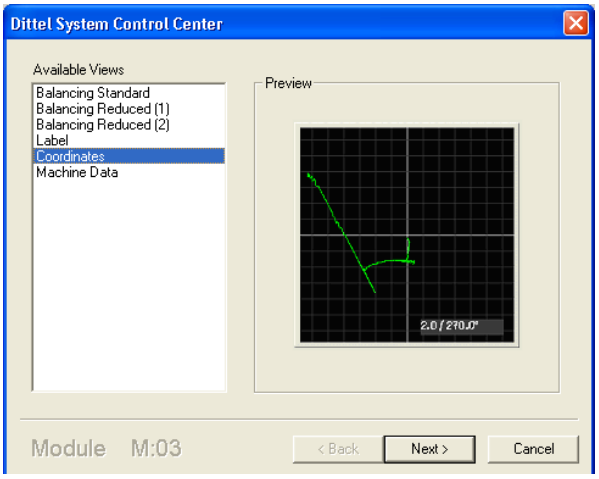
Also in this View, the Balancing Module M600x UP is fully able to work. All balancing functions occur in the background; no error messages are displayed on the screen!



Label

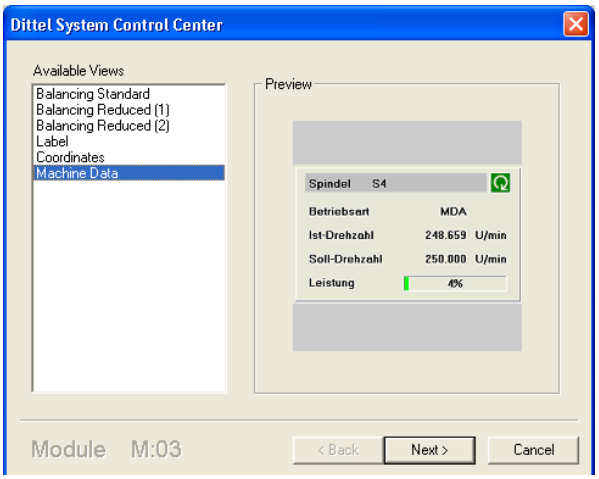
The View “Label” is further reduced to a lettering space which is scalable.

Also in this View, the Balancing Module M600x UP is fully able to work. All balancing functions occur in the background; no error messages are displayed on the screen!



Coordinates

During Manual Balancing, the View “Coordinates” shows the amount of the unbalance and its position in a coordinate system. The View is fully scalable.

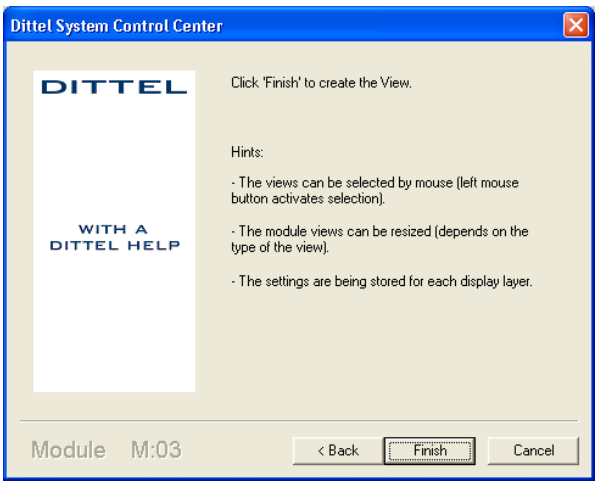


Machine Data
THIS IS NOT A BALANCING FUNCTION!

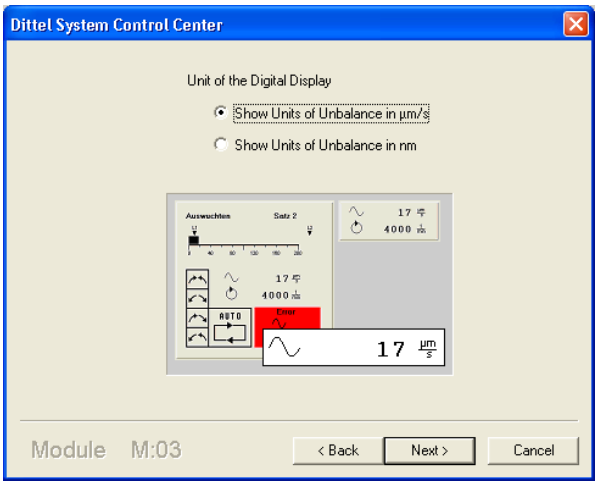
This screen representation “Machine Data” only makes sense in connection with a SINUMERIK® Automation System and OPC server software.

In this view, the machine data of the actual operated spindle are displayed.

With a computer mouse click or the arrow keys [↑] [↓] of your keyboard select the wanted Module view and click on [Next >] or press the [Enter] key.



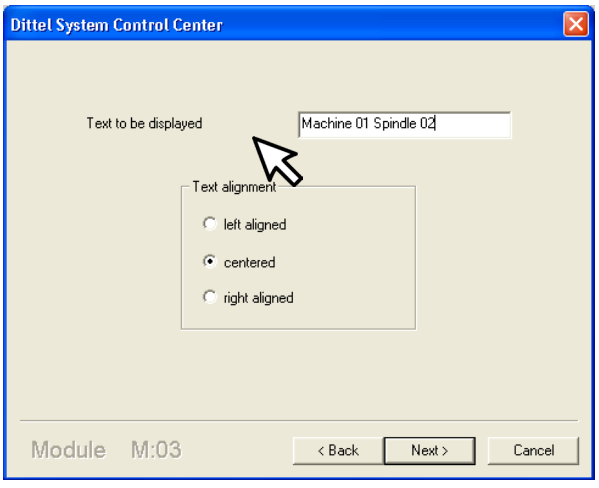
If you have chosen the Module View **Coordinates** this screen Figure opens immediately.



If you have chosen the Module View **Balancing Standard**, **Balancing Reduced (1)** or **Balancing Reduced (2)** the following option display opens.

With this setting you determine the unit of the digital display:
Show Units of Unbalance in µm/s: the digital display and the analog bar graph show the unbalance velocity in µm per second.
Show Units of Unbalance in nm: the digital display shows the displacement in nano-meter whereas the analog bar graph shows the unbalance velocity in µm per second.

With a computer mouse click or the cursor keys [↑] / [↓] select the wanted unit and click on [Next >] or press [Enter].

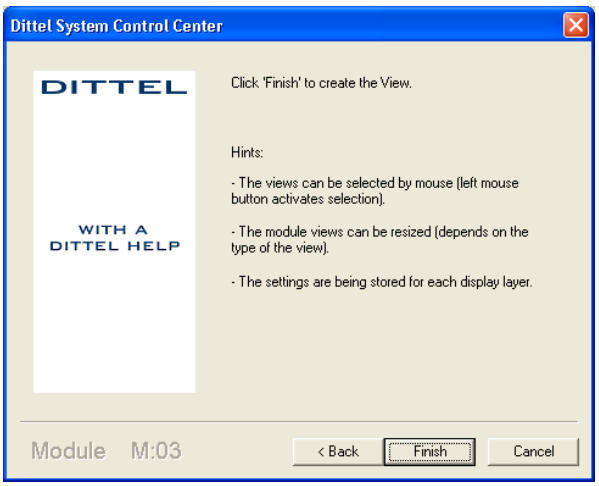


If you have chosen the Module View Label the following screen opens.

Highlight and overwrite the example text with your application, e.g. **Machine 01, Spindle 02**.

With a mouse click, select the Text Alignment of the displayed Label.

Click on [Next >] or press [Enter].

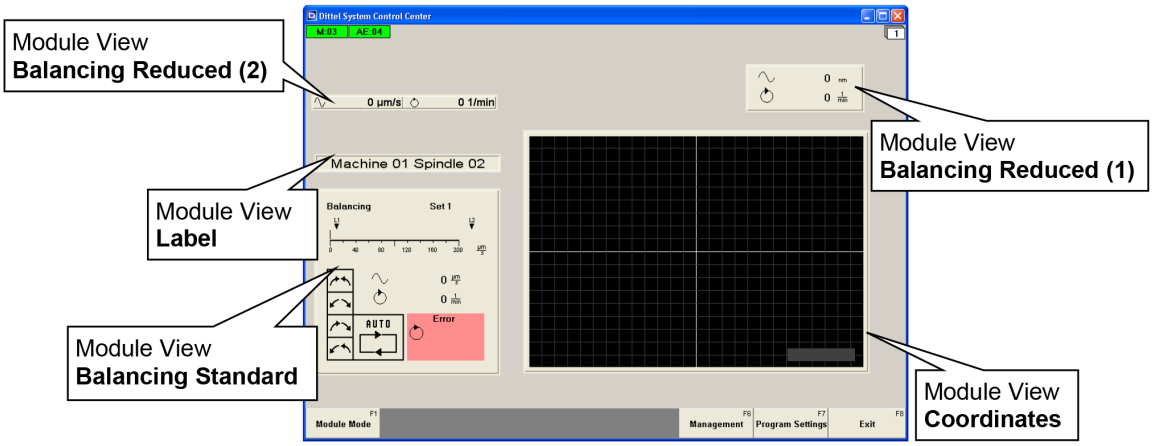


In all five cases the following screen opens.

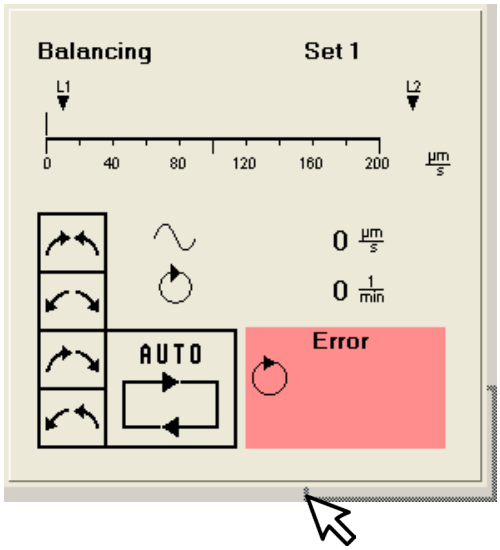
Click on [Finish] or press [Enter] to create the wanted Module View.

N.B.
Make every Balancing Module operable as described above! You can open every Module View on the screen as many as you like. Simply repeat the steps as described above.

The example shows the Balancing Module **M:03** which is opened in all five available Views.



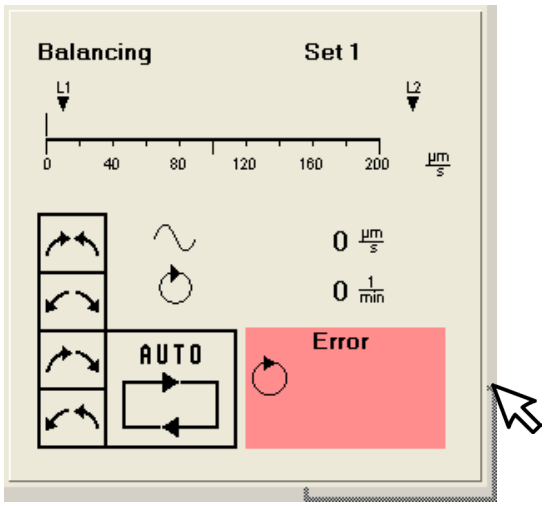
9.2.2 *Module View – highlighting, positioning and scaling*



To position and/or scale the Module View, highlight the Module View first.

To highlight the Module View(s) move the cursor arrow outside the Module View(s), press and hold the LEFT PC mouse button.

Drag a frame into the Module View(s) and release the mouse button. The Module View(s) will be highlighted (marked).

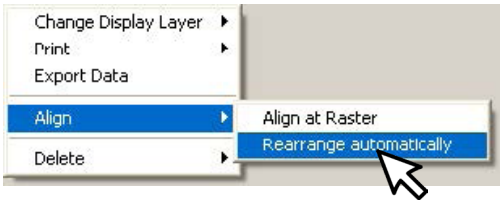


To position the Module View(s) move the cursor arrow to touch the marking of the Module View(s). An additional ‘move’ symbol appears.

Press and hold the LEFT mouse button and move the Module View(s) to a convenient position on the screen.

Release the mouse button.

After highlighting, the width and height of the Module Views **Label, Balancing Reduced (2)** and **Coordinates** can be scaled.
To do this, move the cursor arrow to a “handle” of the marking. The cursor arrow changes to make horizontal, vertical, or diagonal changes in size.
Press and hold the LEFT mouse button and drag the Module View to a convenient size. The font size and symbols adapt to the label size automatically.
Release the mouse button.



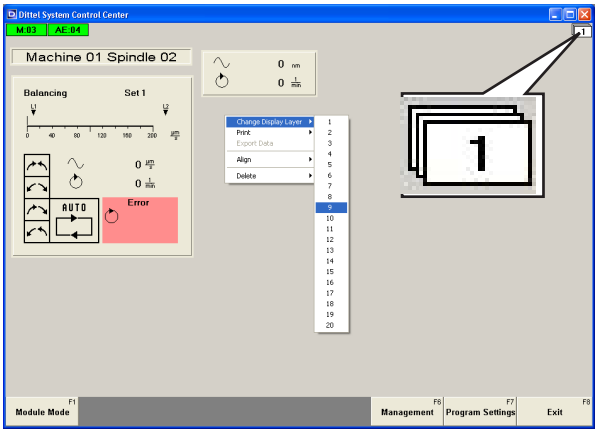
To align different Module Views move the cursor arrow outside a Module View, then press the RIGHT mouse button. Move the cursor to ‘Align’, a context menu opens where you can select how to align the Module Views:

Align at Raster: The Module Views are aligned within a 10 x 10 pixel raster.
Rearrange automatically: The Module Views are arranged automatically from left to right in the order of their module addresses.

With the cursor highlight the wanted alignment and click with the left mouse button.

9.2.3 *Create different Display Layers*

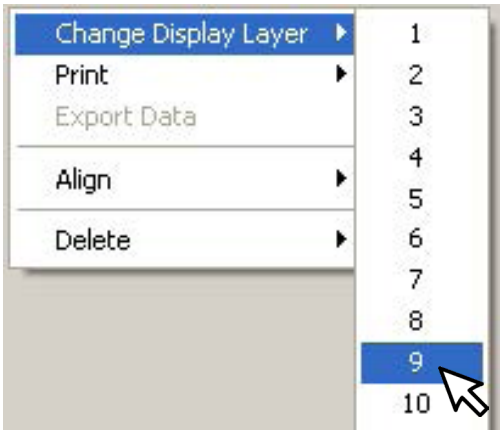
The DSCC Software offers you to create up to twenty different display layers.



To position and/or scale the Module View, highlight the Module View first.

To highlight the Module View(s) move the cursor arrow outside the Module View(s), press and hold the LEFT mouse button.

Drag a frame into the Module View(s) and release the mouse button. The Module View(s) will be highlighted (marked).



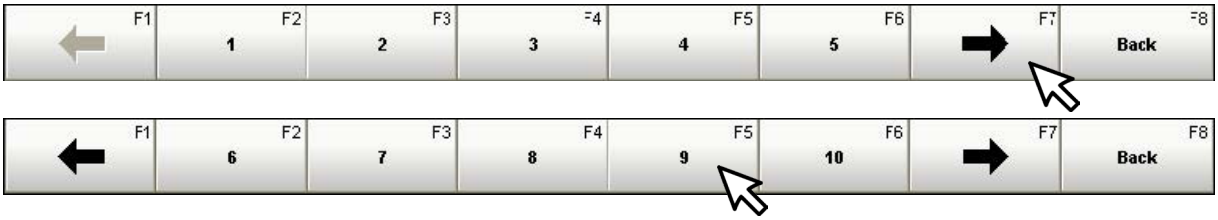
With the mouse button, click on the wanted Display Layer number. The screen changes immediately to the new Display Layer.

Or you press the softkey [Program Settings] / [F7]

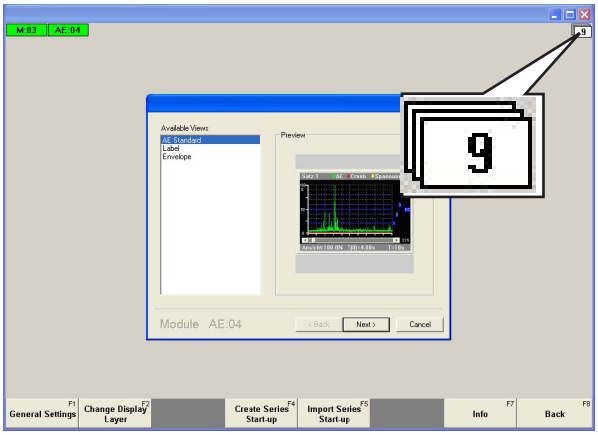
and then [Change Display Layer] / [F2]

With the arrow keys or function keys [F1] / [F7] the keys 1 to 20 are displayed.

Press the key with the wanted Display Layer number. The screen changes immediately to the new Display Layer.



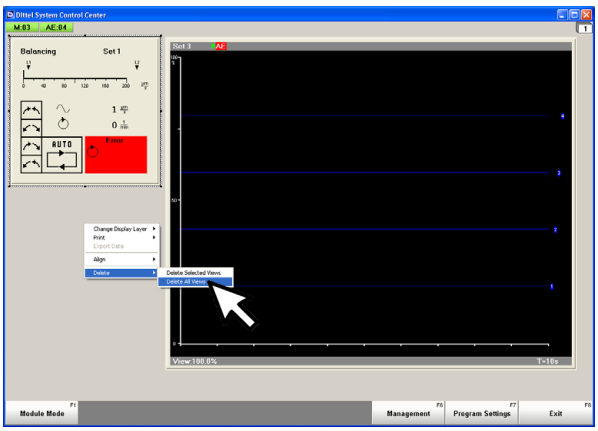
Create a new Display Layer, e.g. Display Layer 9, as described in paragraph“6.8.2.2 Activating the Module(s)” on page 73:



With the key shortcut [Ctrl] + [1] … [9] a direct and fast selection of the first nine Display Layers is possible as well.

9.2.4 *Delete Module View(s)*

N.B.
Never delete all Module Views.
If all Module Views are deleted on all Display Layers, the Balancing Module is no longer operational via the Automation System or computer!

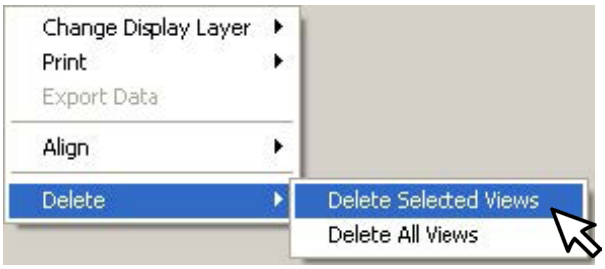


Change to the Display Layer in which you would like to delete Module Views.

If you would like to delete only certain Module Views, highlight the Module View to be deleted. After holding down the RIGHT mouse button, a context menu opens.

Click on **Delete Selected Views**.

The selected Module Views are immediately deleted.



If you would like to delete all Module Views on that Display Layer, hold down the RIGHT mouse button and a context menu opens.

Click on **Delete All Views**.

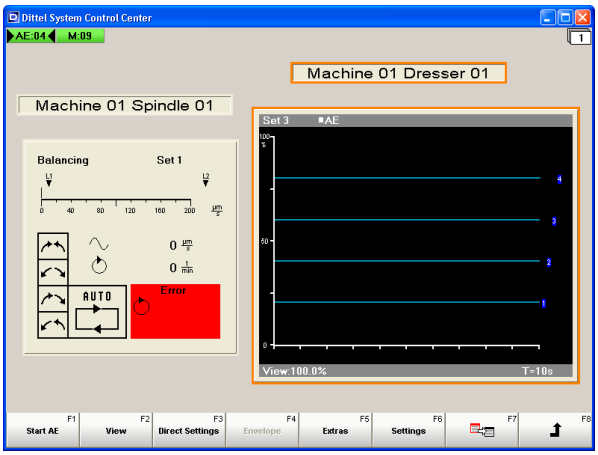
All Module Views are deleted immediately.

9.3 *Module Settings*

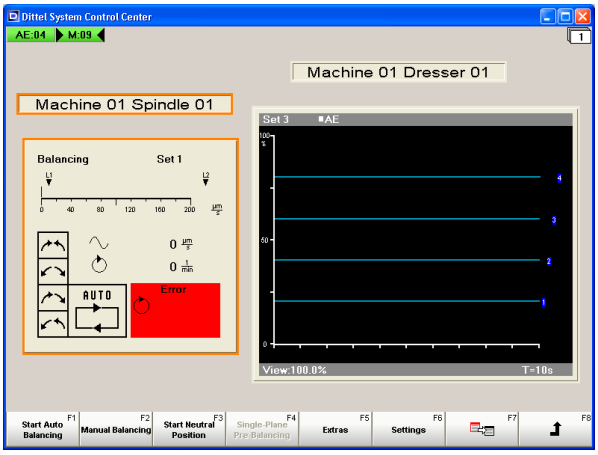
N.B.
The Balancing Module M600x UP is factory pre-set for check and testing purposes. To achieve perfect balancing results it is therefore necessary to adapt the Module M600x UP to your conditions. Please carry out the following adjustments carefully.
The following adjustments are only possible with Access Rights **Expert** or **Administrator**.
All quantities like unbalance (µm/s), Limit 1, Limit 2, speed (1/min), shown in the following illustrations, are examples or factory settings!

When restarting the system always the Display Layer 1 is shown (if not changed). With [Ctrl] + [1] … [9] or the softkeys [Program Settings] - [Change Display Layer] select the Display Layer where the Module to be set is shown.

To carry out the Module Setting of an M600x UP Module press or click on [Module Mode] or [F1].



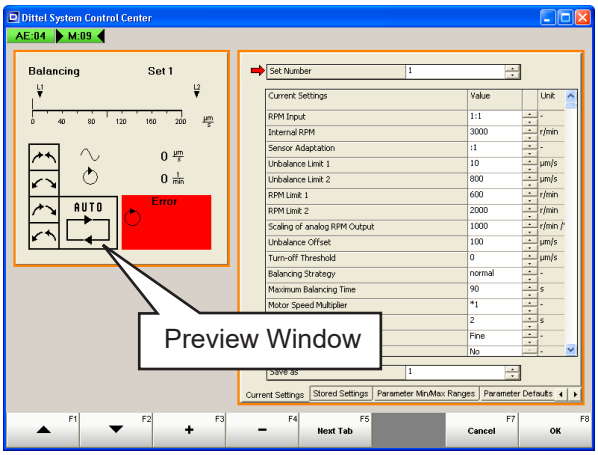
When restarting the program, on the selected Display Layer always the first “visible” Module is highlighted, e.g. **AE:04**, as well as the corresponding Module View (marked orange). The softkeys to operate the Module are displayed.



With several modules “visible” select the module to be set by using the key corresponding to the F7 function or [F7] = next Module, in this example **M:09**. The Module will be highlighted as well as the corresponding Module View (marked orange).

Press or click on the key [Settings] / [F6].

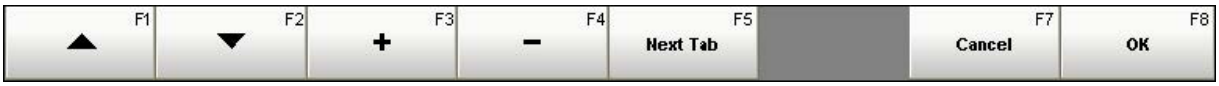
An options display with Preview Window opens – independent of the Module View - to set the selected Balancing Module M600x UP:



Settings using Softkeys:

By pressing the Up- [▲] or Down-key [▼] scroll through the options display, the red arrow cursor jumps into the wanted line.
By pressing the keys [+] or [-] the value of the selected line is changed.
By pressing the key [Next Tab] the next Tab will be shown.

Have a choice of the following tabs:
Current Settings,
Stored Settings,
Parameter Min/Max Range*),
Parameter Defaults*),
M Parameters,
Module Parameters and
Identification Data.
**) only available with access level "Administrator"!*



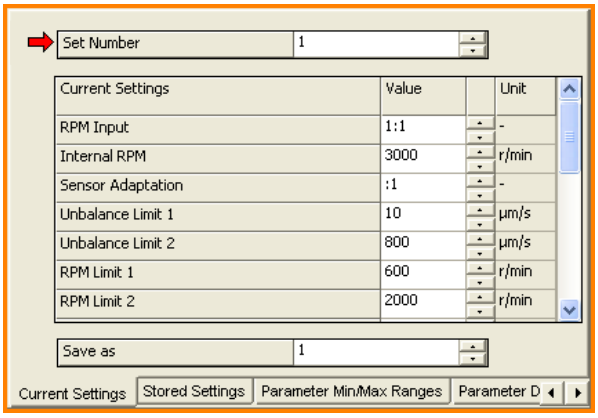
N.B.
When pressing the key [Cancel] / [F7] you return without storage of any changes to the Module Balancing Mode.
When pressing the key [OK] / [F8] changes in the Module Settings are taken over into the set number displayed in the line **Save as**. You return to the Module Balancing Mode.
When pressing the key shortcut [Ctrl] + [H] or the HELP button at the SINUMERIK® keyboard a screen opens containing explanations of the following settings.

9.3.1 *Tab: Current Settings*

N.B.
The following settings determine essentially the balancing quality, as well as the monitoring function of M600x UP. Only trained staff should therefore perform all settings.

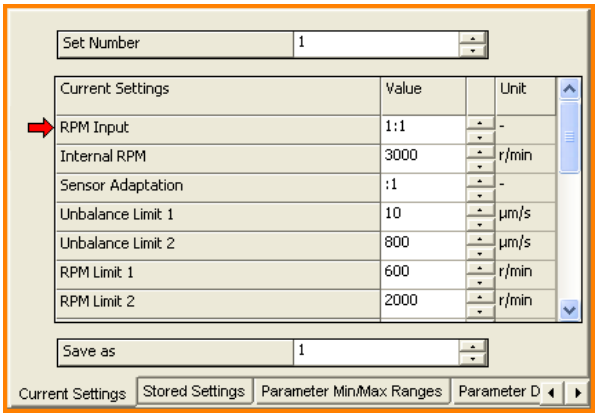
General Settings

Choose the Tab **Current Settings**. When using this Tab you see the consequence of the change on some settings directly on the "Preview Window" presentation.



Set Number

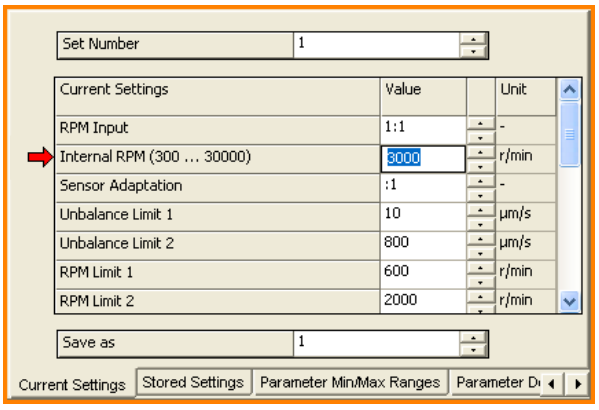
Factory setting: **1**,
can be set with the [+] or [-] key from **1 to 15**.
All parameters, which are necessary to balance a machine tool spindle, can be saved under a Set Number. By switching over the sets it is possible to define different parameters depending on application (e.g. coarse or fine grinding). All parameters can be saved permanently; switching off the M600x UP and/or the machine CNC control does not result in loss of data.



RPM Input (Connector # 15 or # 16)

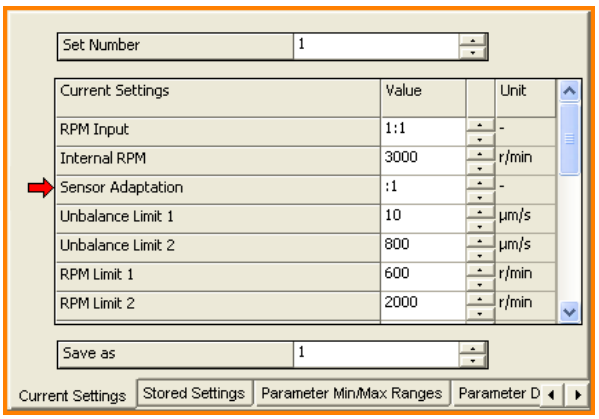
Factory setting: **1:1,**
can be set with the [+] or [-] key to **1:1, 1:2, 1:4 or Internal.**
This setting depends on the number of pulses per revolution, which the Balancing Module receives from the speed sensor. If it receives one, two or four pulse(s) per rev, set the RPM Input to "1:1", "1:2" or "1:4" accordingly.

N.B.
Carefully set the divider ratio of the RPM Input according to the number of pulses per revolution coming from the speed sensor. A faulty setting leads to a wrong display of speed and thus a faulty monitoring of the RPM Limits 1 and 2.
When "RPM Input" is set to "Internal" the Speed Limit 1 and Speed Limit 2 is NOT monitored!
When passing on the rpm signal (via connector # 17) the **RPM Input** of the second or further Modules must be set to the same divider ratio.
When using the Balancing Strategy **Adaptive 2** or the licensed function **Single Plane/Two Plane Pre-Balancing** the Module M600x UP may receive only one pulse per revolution of the spindle affected and therefore **RPM Input** should be set to **1:1**.
The setting **RPM Input → Internal** is NOT suitable for Balancing Strategy Adaptive 2 or for Single Plane/Two Plane Pre-Balancing! **RPM Input → Internal** should be used only temporarily, e.g. when the proximity switch is faulty. For this, the function **Internal RPM** must be adjusted as well (see next setting).



Internal RPM

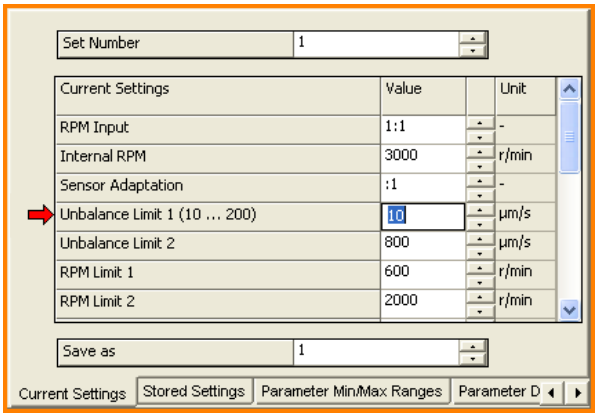
Factory setting: **3000 r/min,,**
can be set with the [+] or [-] key from **300 r/min** to **30,000 r/min** or entered directly with the keyboard.
This feature is used, when the proximity switch is faulty and a spare not at hand, or for environmental vibration measurements without the spindle running.
Use the [+] or [-] key to set the Module to the operational speed of the machine manually. The Balancing Module M600x UP is then able to operate without rpm signal.
Remember to set the "**RPM Input**" to "**Internal**" (refer to previous step).
When varying the spindle's speed the value of the **Internal RPM** has to be adjusted as well. Otherwise less or no unbalance is shown although perhaps a large unbalance is present.



Sensor Adaptation (Connector # 18)

Factory setting: **1,**
can be set with the [+] or [-] key to **:1, :2, :3 or :6**.
With this operator defined setting, the signal of the Acceleration Sensor will be attenuated by the ratio as stated.
E.g., at high unbalance signals coming from the Acceleration Sensor, overdriving the amplifier can be prevented or when using a high sensitive Acceleration Sensor, the input signal can be attenuated.

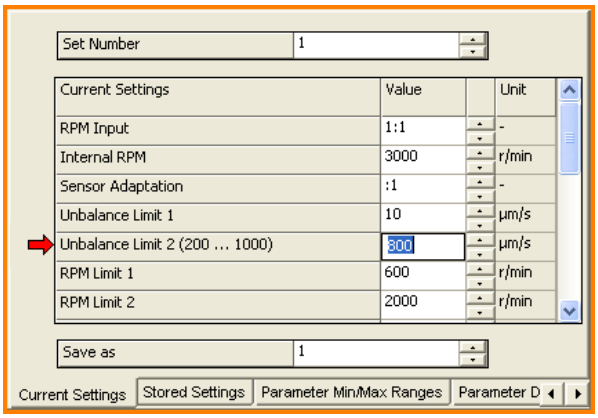
N.B.
The setting of the Sensor Adaptation affects the analog and digital display of the unbalance in µm/s or nm, the display of the Unbalance Limits 1 and 2 and the Unbalance Offset. In addition, it affects the status of the Unbalance Limits 1 and 2 and the Filtered and Raw Unbalance signals, which are available at the static interface connector # 2 and via PROFIBUS/PROFINET.
For **M6000 UP** Balancing System the unbalance display is only true with a fictional Acceleration Sensor having a sensitivity of 1000 pC/g and a Sensor Adaptation setting of :**1**.
For **M6001 UP** Balancing System the unbalance display is only true with a fictional Active Acceleration Sensor having a sensitivity of 300 mV/g and a Sensor Adaptation setting of :**1**.
In case of M6001 UP use only Active Acceleration Sensors.



Unbalance Limit 1

Factory setting: **10 µm/s,**
can be set with the [+] or [-] key from **10 µm/s** to **200 µm/s** or entered directly with the keyboard.
On the Preview Window or Balancing Standard View, the quantity of the Unbalance Limit 1 is indicated as triangle, marked **L1**.
This operator defined setting establishes the vibration level, which acts as an “upper limit 1” for the process. When reached, this setting will indicate the need to perform a re-balance operation. This indication is given via pin 4 of connector # 2 (HIGH signal turns to LOW), or equivalent via PROFIBUS interface, connector # 13, or PROFINET interface, connectors # 30/31 to the machine CNC control.

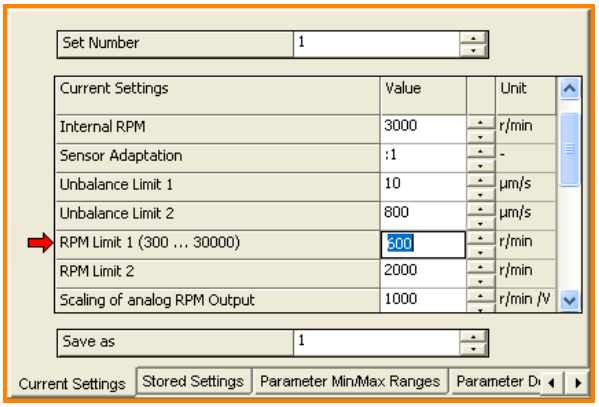
N.B.
Carry out the setting of the Unbalance Limit 1 carefully! An incorrect setting of the Unbalance Limit 1 leads to a premature or delayed message “Unbalance 1 Limit exceeded”.
Additionally note the setting of “Sensor Adaptation” and “Unbalance Offset”.



Unbalance Limit 2

Factory setting: **800 µm/s,**,
can be set with the [+] or [-] key from **200 µm/s** to **1,000 µm/s** or entered directly with the keyboard.
On the Preview Window or Balancing Standard View, the quantity of the Unbalance Limit 2 is indicated as triangle, marked **L2**.
This operator defined setting establishes the vibration level, which acts as an indicator of the operational upper safety limit for the machine tool. When reached, this setting will indicate an inadmissible unbalance. This indication is given at pin 5 of connector # 2 (HIGH signal turns to LOW), or equivalent via PROFIBUS interface, connector # 13, or PROFINET interface, connectors # 30/31. This signal, fed to the machine CNC control, may be used to emergency shutdown the machine tool.

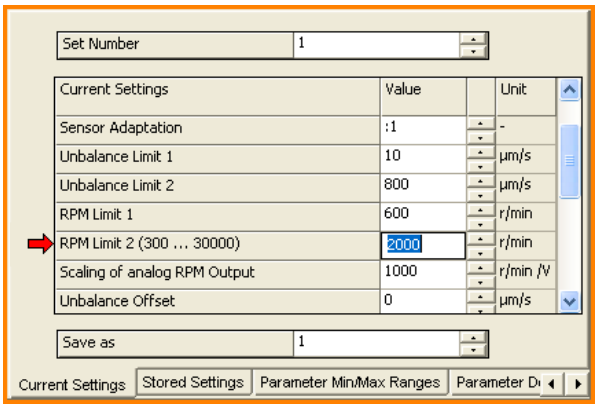
N.B.
Carry out the setting of the Unbalance Limit 2 carefully! An incorrect setting of the Unbalance Limit 2 leads to a premature or delayed message “Unbalance 2 Limit exceeded”. This may cause an emergency shutdown signal before time or an unacceptably high unbalance arises.
Please note that the sum of the Unbalance Offset and the Unbalance Limit 2 must be less than 1020. Otherwise, the Unbalance Limit 2 is no longer monitored.
Notice the setting of “Sensor Adaptation” and “Unbalance Offset”.



RPM Limit 1

Factory setting: **600 r/min,**
can be set with the [+] or [-] key from **300 r/min** to **30,000 r/min** or entered directly with the keyboard.
With the operator defined setting RPM Limit 1 the speed of the machine spindle may be monitored.
For example, if the actual spindle speed has not reached RPM Limit 1, the motor drive may be faulty.
When the actual speed exceeds RPM Limit 1 indication is given via pin 6 of connector # 2 (HIGH signal turns to LOW), or equivalent via PROFIBUS interface, connector # 13, or PROFINET interface, connectors # 30/31, to the machine CNC control.

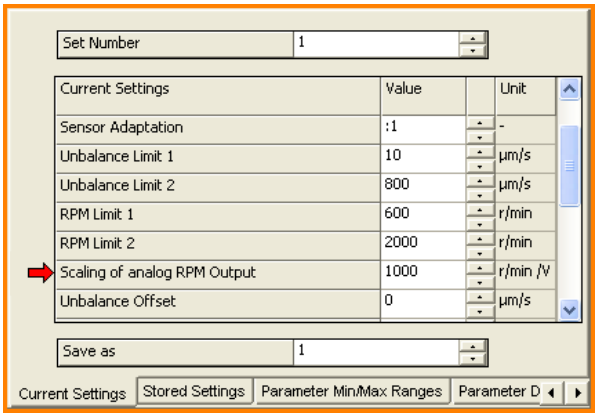
N.B.
The M600x UP module may get one, two, or four switching pulses per revolution of the spindle. If the setting of the Speed Input does not correspond with the number of switching pulses, it leads to a wrong display of speed and thus a wrong monitoring of the Speed Limit 1.
When “RPM Input” is set to “Internal” (refer to ‘RPM Input (Connector # 15 or # 16)’ Figure) the RPM Limit 1 is NOT monitored!
If setting of the RPM LIMIT 1 is not possible, this setting is inhibited by an »Administrator« for safety reasons (see Tab ‘M Parameters’)!



RPM Limit 2

Factory setting: **2000 r/min,**
can be set with the [+] or [-] key from **300 r/min** to **30,000 r/min** or entered directly with the keyboard.
With the operator defined setting RPM Limit 2 a second speed of the machine spindle may be monitored.
For example, if the actual spindle speed is higher than RPM Limit 2, the grinding wheel could be damaged.
When the actual speed exceeds RPM Limit 2 indication is given at pin 7 of connector # 2 (HIGH signal turns to LOW) or equivalent via PROFIBUS interface, connector # 13, or PROFINET interface, connectors # 30/31. This signal, fed to the machine CNC control, may be used to stop the machine tool.

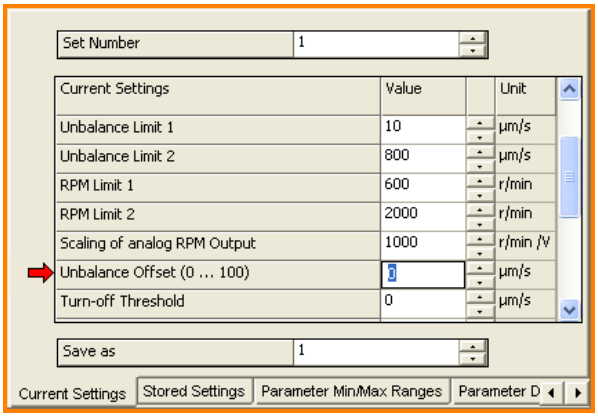
N.B.
The M600x UP module may get one, two, or four switching pulses per revolution of the spindle. If the setting of the Speed Input does not correspond with the number of switching pulses, it leads to a wrong display of speed and thus a wrong monitoring of the Speed Limit 2.
When “RPM Input” is set to “Internal” (refer to ‘RPM Input (Connector # 15 or # 16)’ Figure) the RPM Limit 2 is NOT monitored!
If setting of the RPM LIMIT 2 is not possible, this setting is inhibited by an »Administrator« for safety reasons (see Tab ‘M Parameters’)!



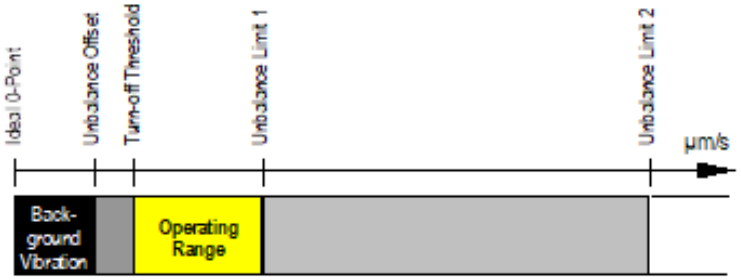
Scaling of analog RPM Output

Factory setting: **1000 rpm/V,**
can be set with the [+] or [-] key to **1000 rpm/V**, **2000 rpm/V** or **3000 rpm/V**.
The spindle speed is presented as a proportional DC voltage at pin 24 of connector # 2, for example to operate a recording equipment.

N.B.
Perform the setting of the Scaling of analog RPM Output carefully. A wrong scale factor can lead to a misinterpreted output voltage of the spindle speed.
The output voltage is limited to 10 Vdc!
At a setting of, e.g. 2000/V, a maximum speed of 20,000 rpm can be measured (corresponds to the limit of 10 Vdc). The output voltage will not increase any further at a speed of more than 20,000 rpm.

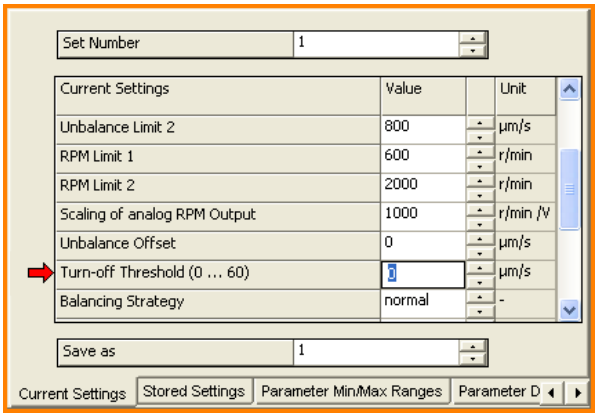


Unbalance Offset
Factory setting: **0 µm/s,**
can be set with the [+] or [-] key from **0 µm/s** to **100 µm/s** or entered directly with the keyboard.
Since no balancing system is capable to balance a grinding wheel to a value below the environmental vibration level, this operator defined setting “suppresses” vibration coming from adjacent machinery, etc.



At the very beginning set the Unbalance Offset to “0 µm/s”! The Unbalance Offset is defined during “6.9 Getting started with manual Balancing” on page 94.

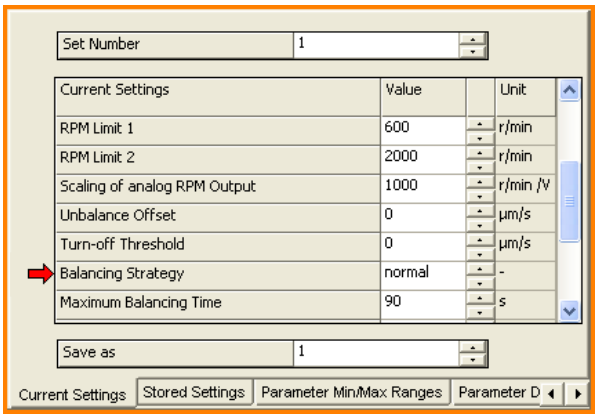
N.B.
Please note, that the sum of Unbalance Offset and Unbalance Limit 2 must be less than 1020. Otherwise, the Unbalance Limit 2 is no longer monitored.
Additionally note the setting of “Sensor Adaptation”.



Turn-off Threshold

Factory setting: **0 µm/s,**
can be set with the [+] or [-] key from **0 µm/s** to **60 µm/s** or entered directly with the keyboard.
The setting of the Turn-off Threshold is associated to the Unbalance Limit 1.
The setting of the Unbalance Offset is done due to ambient or background vibrations (see above). The operator defined setting of the Turn-off Threshold however allows a certain tolerance in balancing. It can be set from 0 to 60 µm/s, depending on quality demands or time requirements.

N.B.
The Unbalance Limit 1 must be at least 5 µm/s above the Turn-off Threshold (operating range), forbidden settings are inhibited!
For the first balancing tests, leave the Turn-off Threshold at "0 µm/s"! Setting of the Turn-off Threshold is defined later, if necessary.



Balancing Strategy

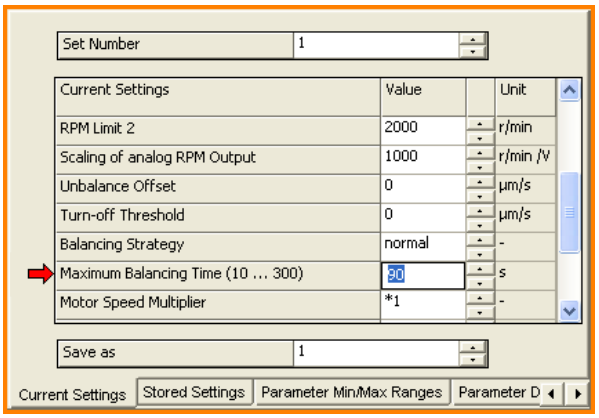
Factory setting: **Normal**,
can be set with the [+] or [-] key to:

Normal Standard balancing method. Same reaction of the balancing weights 1 and 2 when they are moving together left or right, or when they moving to each other or apart.

Adaptive 1 This balancing strategy uses the absolute amount of the unbalance to position the balancing weights.

Adaptive 2 This balancing strategy uses additionally the phase angle information to position the balancing weights. **THIS STRATEGY IS NOT SUITABLE WHEN THE MODULE IS SET TO 'RPM INPUT' → 'INTERNAL' or '1:2' or '1:4'!**

N.B.
Due to the variety of machine tools, no statement can be made which strategy works more correctly or faster! Observe the operation of the system on its first few balancing cycles, then change the Balancing Strategy, add manually an unbalance and run two or three more tests! to "6.10.2.1 Optimizing the Balancing Process" on page 104.

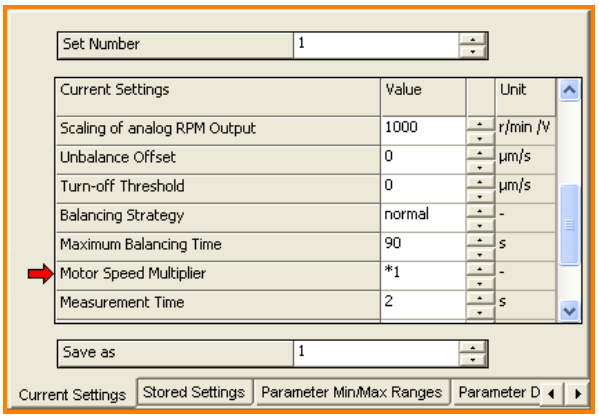


Maximum Balancing Time

Factory setting: **90 s,**
can be set with the [+] or [-] key from **10 s** to **300 s** in steps of 1 second or entered directly with the keyboard.
This operator defined setting establishes the maximum duration of a balancing cycle. When balancing lasts longer, this setting will indicate any malfunction. This indication is given by:

- a clock symbol appearing in the red ERROR area,
- a LOW signal each at pin 2 and 3 of connector # 2 or equivalent at PROFIBUS interface connector # 13 or PROFINET connectors # 30/31,
- A red lighting LED # 7.

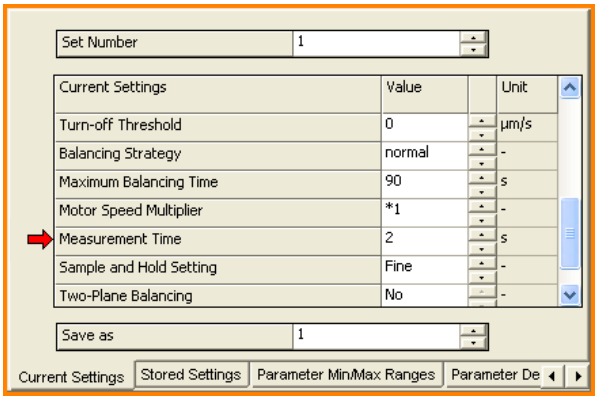
N.B.
Exceeding the balancing time does NOT cause necessarily an automatic balancing stop, but may be initiated by the machine CNC control.



Motor Speed Multiplier

Factory setting: **×1**,
can be set with the [+] or [-] key from **×1** to **×5** in steps of 0.5.
With all balancing strategies, the setting "**×1**" is suitable for approximately 80% of the applications.
An increase of the **Motor Speed Multiplier** value causes longer duration of the pulses sent to the motors in the Balancing Unit. The weights are moving longer but this may result in "overcompensation", i.e. unbalance swings about the zero point (observe unbalance indication). In this case, reduce the **Motor Speed Multiplier** value.

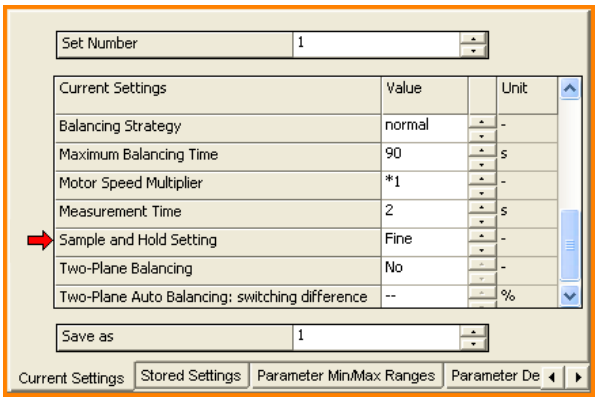
N.B.
To determine the correct setting, it is necessary to observe the operation of the system on its first few balancing cycles! Refer to "6.10.2.1 Optimizing the Balancing Process" on page 104.



Measurement Time

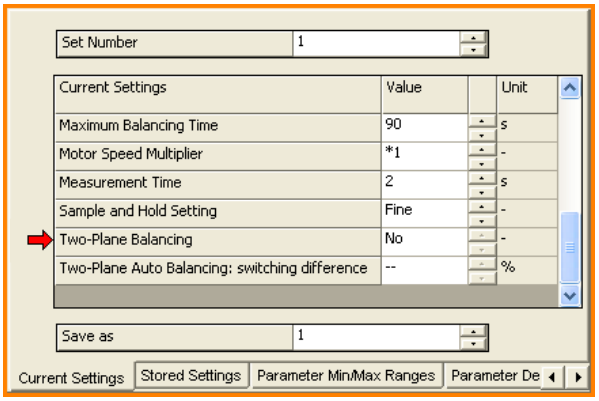
Factory setting: **2 s,**
can be set with the [+] or [-] key from **1 s** to **10 s** in steps of 1 second.
Due to our unique peak measurement method, it is possible to balance automatically, even if a beat frequency occurs on the unbalance signal. If a beat frequency appears at a certain operating speed, whose period is longer than 2 sec (standard measurement time), the measurement time has to be extended such, that a complete beat period is equal to the Measurement Time.

N.B.
A beat frequency is visible by a rising and falling unbalance indication (bar graph or digits), in particular on a balanced system.
Determine the duration of a beat frequency period by observation on its first few balancing cycles.



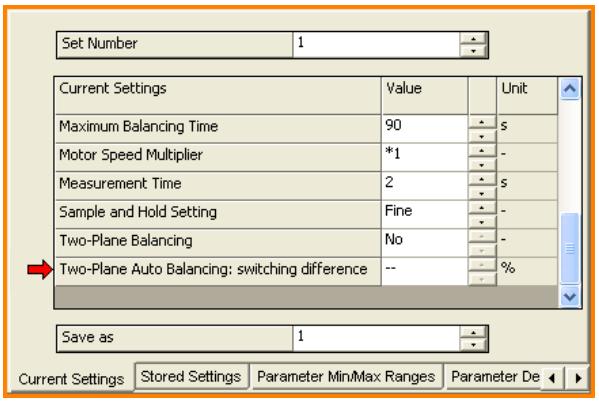
Sample and Hold Setting

Factory setting: **Fine,**
can be set with the [+] or [-] key to **Fine, Medium or Rough**.
If the Balancing System M600x UP is exposed to heavy interference or if noisy signals of the Acceleration Sensor occur, it is necessary to set the system to **Medium** or **Rough**. Otherwise, interference may cause the system to change its balancing mode uncontrollable. Balancing time is increased by this measure.
On the other hand, at low interference surroundings and very stiff machine spindles, the system may be set to **Fine** so that a small increase of unbalance already causes a change to the next balancing mode.



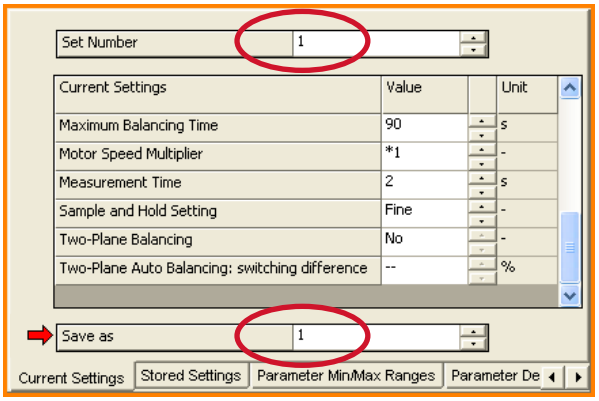
Two-Plane Balancing

Factory setting: **No**,
can be set with the [+] or [-] key to:
This setting is only enabled when the function **Two-Plane Pre-Balancing** and/or **Two-Plane Auto Balancing** is licensed!



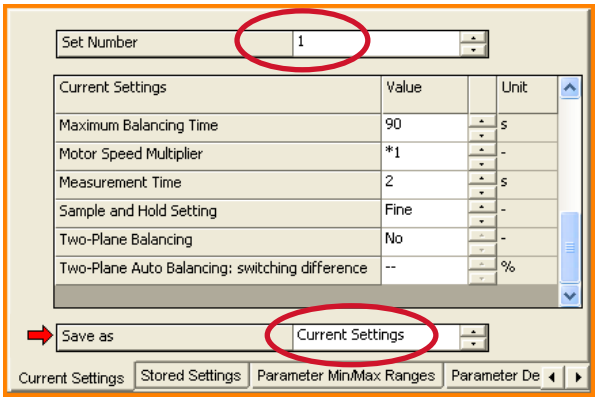
Two-Plane Auto Balancing: switching difference

Factory setting: **--%**,
This setting is only enabled when the function **Two-Plane Auto Balancing** is licensed!

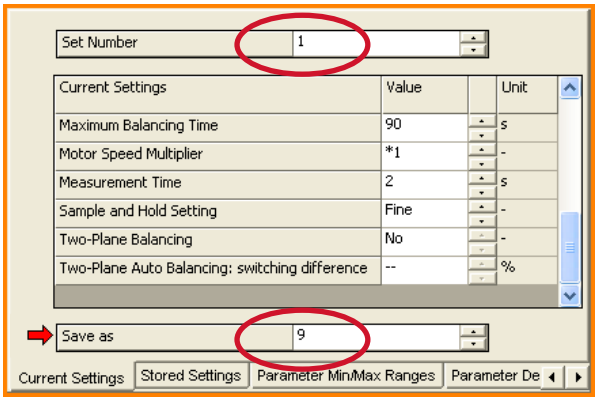


Save as

can be set with the [+] or [-] key to **Current Settings or 1 … 15**.
Standard Setting: If you want to store the changes permanently under the same **Set Number** as above, set with the [+] or [-] key **Save as** to the Set Number above and click to **OK**. The Set Number will be overwritten with the new data. You return to the Module Mode.

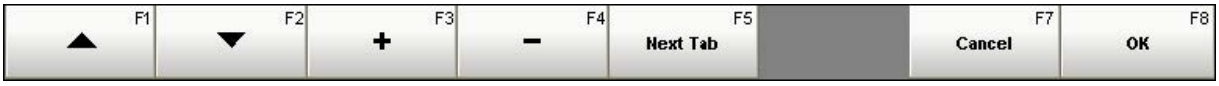


If you want to store the changes temporarily (e.g. for testing) set with the [+] or [-] key **Save as** to '**Current Settings**' and then click to **OK**. You return to the Module Mode. The new settings are taken over till the next Set Number is called up.



If you want to store the changes under a different **Set Number** as above, set with the [+] or [-] key **Save as** to **1 … 15** and click to **OK**. The new Set Number will be overwritten with the new data. You return to the Module Mode.

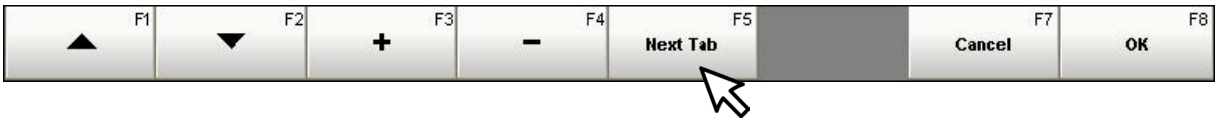
If you want to bypass the changes click or press the key [Cancel]. You return to the Module Mode.



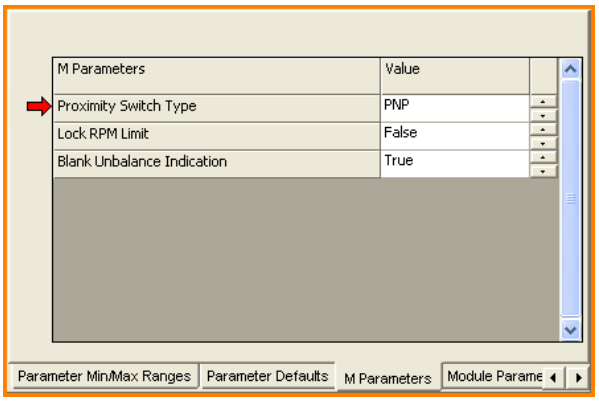
N.B.
If you want to save new settings in a further set, press the key [Settings] again and choose the Set Number 2, for example. Repeat the settings as described above.
If you would like to change settings of another Balancing Module M600x UP, press the key “next Module” so often till the desired Module is highlighted. Then press the key [Settings] and choose the Set Number 5, for example. Repeat the settings as described above.

9.3.2 *Tab: M Parameters*

Press the key [Settings] again and open the Tab M Parameters by pressing or clicking on key [Next Tab] / [F5] repeatedly.



N.B.
The following settings are true for all 15 Sets of the Balancing Module!



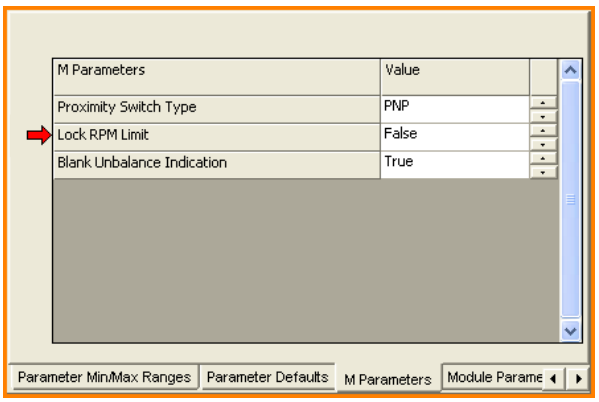
Proximity Switch Type

Factory setting: **PNP,**
can be set with the [+] or [-] key to:

NPN enables the M600x UP to handle rpm signals from a NPN Proximity switch.

PNP enables the M600x UP to handle rpm signals from a PNP Proximity switch.

In our Mechanical Balancing Systems PNP Proximity switches are fitted as standard!

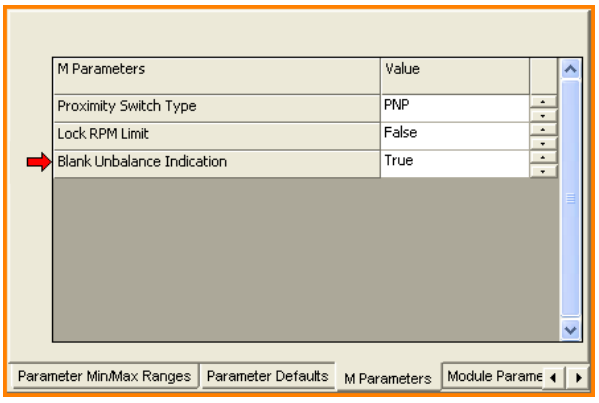


ONLY ACCESSIBLE WITH ADMINISTRATOR RIGHTS!
Lock RPM Limit

Factory setting: **False,**
can be set with the [+] or [-] key to:

True i.e. the RPM Limits 1 and 2 are locked. They cannot be altered (see paragraph 6.3, Module Settings, RPM Limit 1 and 2).

False i.e. the RPM Limits 1 and 2 can be altered by an **Expert** or **Administrator**.

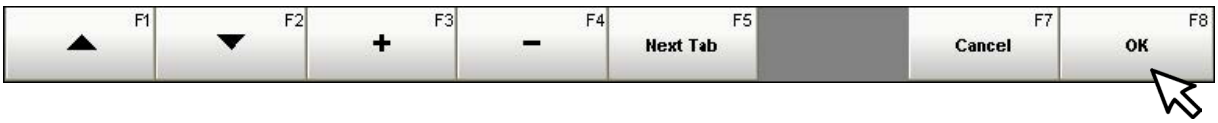


Blank Unbalance Indication

Factory setting: **True,**
can be set with the [+] or [-] key to:

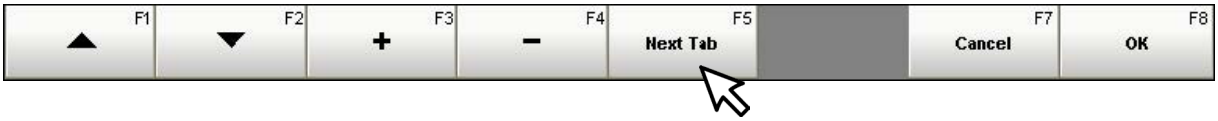
True After a successful Automatic Balancing cycle (unbalance was less than the turn-off threshold or has reached the 0-point), the indication of the unbalance is blanked (display “0”) till the increasing unbalance exceeds **Unbalance Limit 1**.

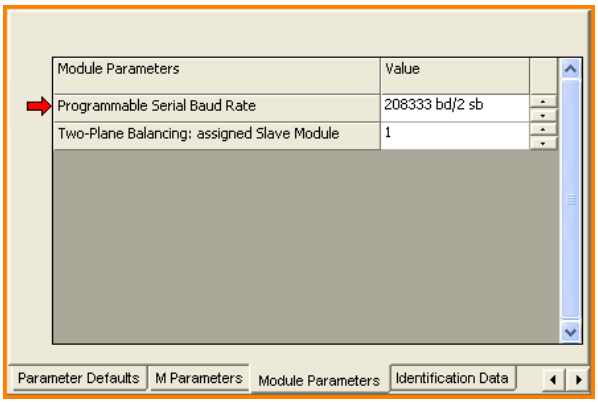
False The actual unbalance is always displayed digitally and by an analog bar graph (true for Balancing Standard View) or only digitally (true for Balancing Reduced Views).



N.B.
Save your settings of this tab by clicking or pressing on key [OK] / [F8]. You are leaving the Tab **M Parameters**.
Bypass any changes by pressing or clicking on key [Cancel] / [F7]. You are leaving the Tab **M Parameters.**

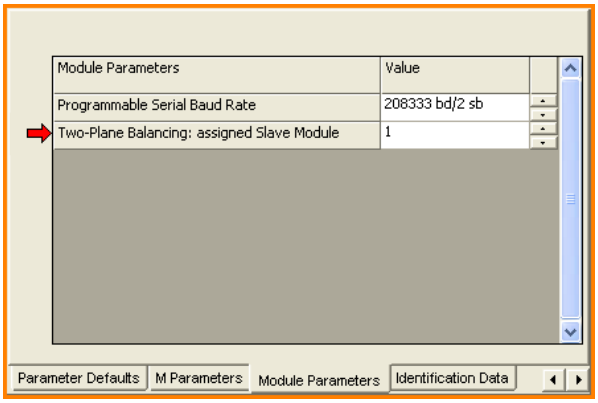
9.3.3 *Tab: Module Parameters*





Programmable Serial Baud Rate

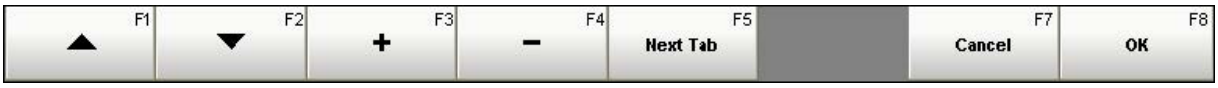
Factory setting: **208333 bd/2 sb**,
can be set with the [+] or [-] key to a Baud rate (bd) of 1200, 2400, 4800, 9600, 19200, 38400, 57600, 125000, 156250 or 208333, no parity. Except 208333, all others can be set to either 1 or 2 Stopbit(s) (sb).



Two-Plane Balancing: assigned Slave Module

Factory setting: **1,**
can be set with the [+] or [-] key from **1** to **99**.

This setting is only enabled when the function **Two-Plane Pre-Balancing** or **Two-Plane Auto Balancing** is licensed!



10 GETTING STARTED WITH MANUAL BALANCING

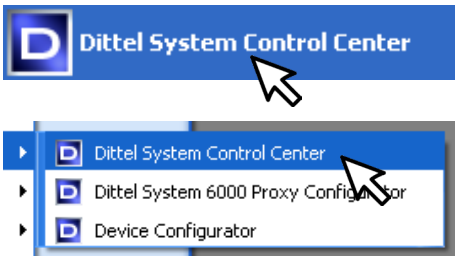
This Section contains a description how to get started when operating the Balancing Module M600x UP the first time in the Balancing Function. The System needs to be set for proper operation by first initiating a kind of learning cycle, which will compare the background vibrations with the specific machine and spindle vibrations.

N.B.
To get started with the Balancing Module M600x UP we recommend to select the Standard Balancing view so you can observe unbalance, speed, error etc.

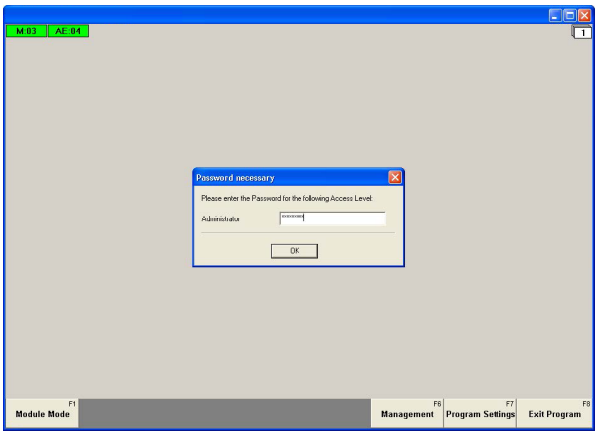
10.1 *Prerequisite*

The machine tool spindle is turning with less than 300 rpm or is standing still!
A Balancing Module M600x UP is installed, pre-set (for example module address 03) and properly powered (LED # 4 lights); on your computer or automation system the DSCC Software is installed and operating; Proximity Switch, Acceleration Sensor and Transmitting Coil are mounted on the machine and connected to the M600x UP Module; a suitable mechanical Balancing System is fitted in or on the machine spindle.

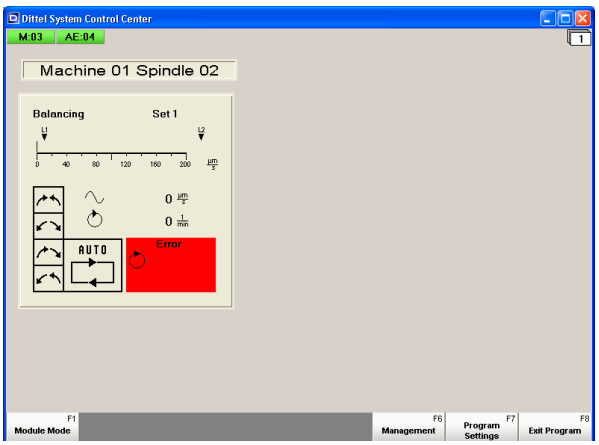
10.2 *Getting started*



Start the Program on your Automation System or computer by clicking on button Start and then on symbol “Dittel System Control Center”.
Or start the Program by clicking on buttons Start / Programs / Dittel System 6000 and finally on the symbol “Dittel System Control Center”.
In the SINUMERIK® HMI-Environment you can start the DSCC Program by pressing the appropriate softkey.

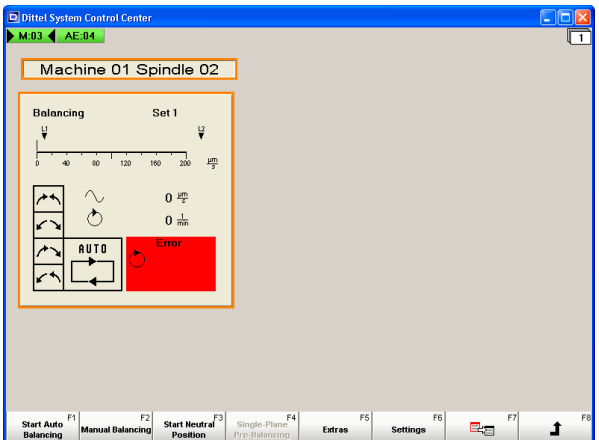


When the password prompt is activated (see paragraph “6.7.2.4 General Settings: Access Rights” on page 65) the opposite screen is displayed.
If no password has been entered till now, click on [OK] or press the key [Enter] on your computer keyboard or [Input] on the SINUMERIK® keypad.
Otherwise enter your password and click on key [OK] or press the [Enter] / [Input] key.
The next screen opens.

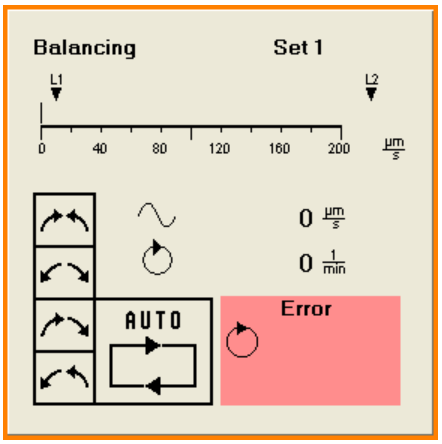


When the password prompt is NOT activated (see paragraph “6.7.2.4 General Settings: Access Rights” on page 65) this screen opens immediately (number of views depends on your setting).
The example shows a connected and activated Balancing Module M600x UP **M:03** and a connected Process Monitoring Module AE6000 UP **AE:04**.

Click or press on the key [Module Mode] or F1.



- The Module M:03 will be highlighted **M:03**
- as well as the Standard Balancing view,
- the key assignment changes into Balancing Mode.

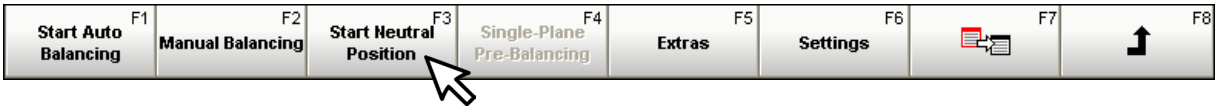


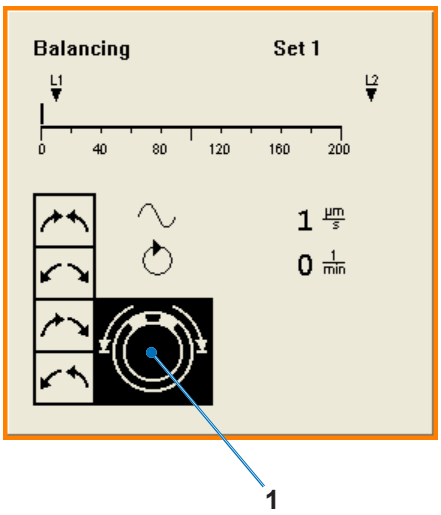
It is displayed:

- the module Set number (here 1),
- the settings of the module Set (L1, L2),
- the actual Unbalance (here 0 µm/s),
- the spindle's speed (here 0 1/min),
- the Error message "speed" (speed of spindle is less 72 rpm).
- the Module M600x UP is ready for Automatic Balancing (standby).

10.2.1 *For electromechanical Balancing Heads with Neutral Position only:*

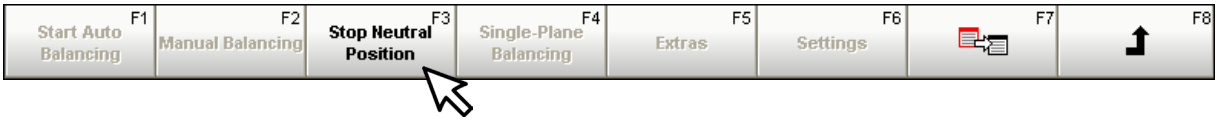
N.B.
Before the first start-up of the tool spindle, place the balancing weights of the electromechanical Balancing Head exactly opposite, i.e. into neutral position. Otherwise – in the most unfavourable case – the "heavy part" of the grinding wheel could meet the "heavy part" of the Balancing Head.

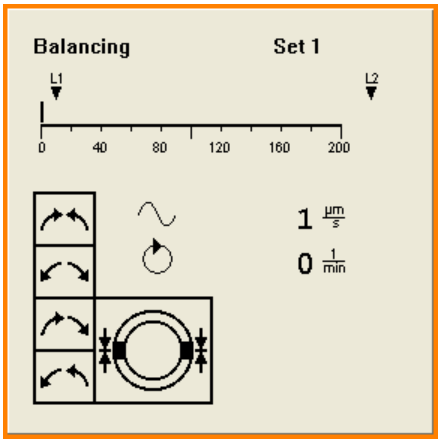




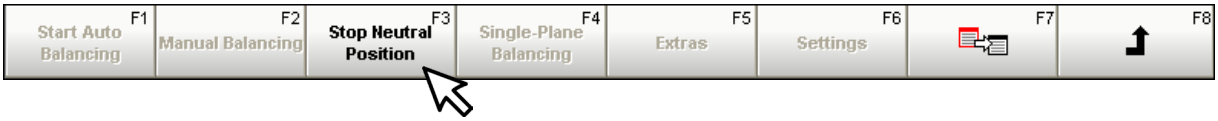
Now click or press on the key [Start Neutral Position]. Or the machine CNC control applies a HIGH signal at connector # 2 / pin 13, equivalent via PROFIBUS, connector # 13, or PROFINET, connectors # 30/31.
The screen changes.

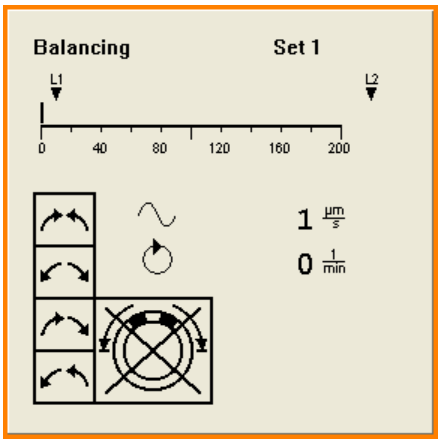
The inverted symbol **1** indicates that the two balancing weights of the Balancing System are moving towards the neutral position.
The movement can be aborted any time by pressing or clicking on the key [Stop Neutral Position] or by applying a LOW signal at connector # 2 / pin 13 (equivalent via PROFIBUS/PROFINET). Immediately you return to the standby Automatic Balancing Mode.





After reaching the neutral position, the driving motors switch off. The opposite figure shows the screen after the balancing weights have reached their neutral position.
Simultaneously a HIGH signal is available at pin 8 of connector # 2 (equivalent via PROFIBUS/PROFINET) to report that the weights are in their neutral position.
The key [Stop Neutral Position] changes to [Neutral Position completed].
Exit the Neutral Position function by pressing or clicking on key [Neutral Position completed].
You return to the standby Automatic Balancing Mode.

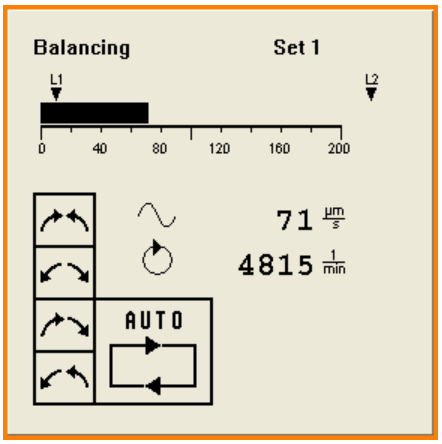




If a crossed out symbol appears instead (as shown in opposite Figure) either an unsuitable Balancing Head is installed (without neutral position feature) or the balancing weights have not reached their neutral position (e.g. malfunctioning system). In addition, a failure signal (LOW) is available at pin 2 of connector # 2 (equivalent via PROFIBUS/PROFINET).
Continue by pressing or clicking on key [Neutral Position completed], investigate cause and start a new trial by clicking or pressing on the [Start Neutral Position] key.

10.3 *Manual Balancing*

N.B.
Start the grinding machine and run the wheel at an operating speed not less than 300 rpm.
Turn on the coolant flow and all secondary machine systems.
In order to balance properly never balance during grinding or dressing!



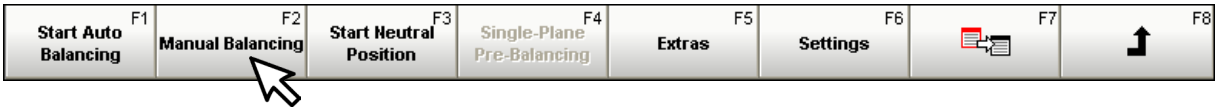
The Balancing Module M600x UP is in the stopped Automatic Balancing Mode (standby).
It is displayed:

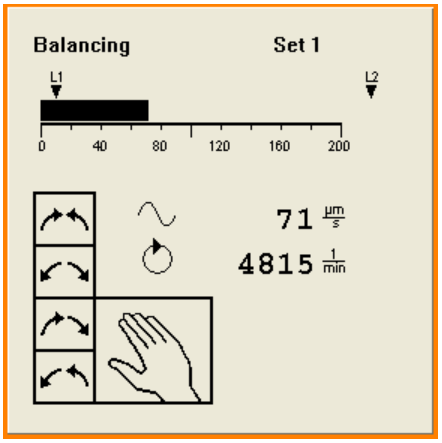
- the Module's Set number,
- the Limits 1 and 2 (L1, L2),
- current unbalance level shown on the bar graph (auto scaling from 0 to 200 µm/s or 0 to 1000 µm/s) and in digits (depends on setting: units of nm or µm/sec),
- current speed (1/min).

No red Error message may be displayed:

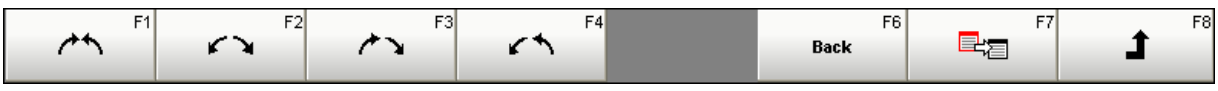
- no speed-symbol,
- no unbalance-symbol,
- no transmitting-symbol,
- no clock-symbol!

If an Error message is visible anyway, refer to Appendix B, Troubleshooting Guide.

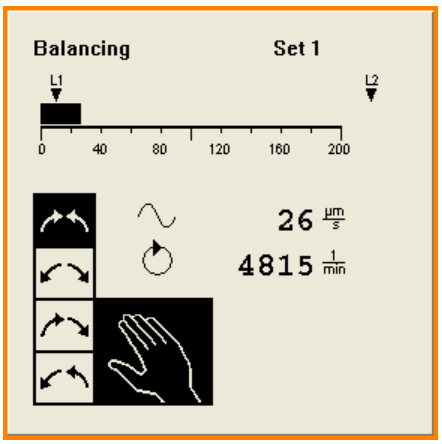




- By pressing or clicking on the key [Manual Balancing] the operating mode Manual Balancing gets active.
- The AUTO symbol changes to MANUAL symbol, the key assignments change for manual operation.
- By pressing or clicking on the arrow keys the two balancing weights in the Balancing Head are moved correspondingly; the MANUAL symbol and the corresponding operating mode symbol are displayed inverted:



The balancing weights are moving as long as the arrow key is operated.

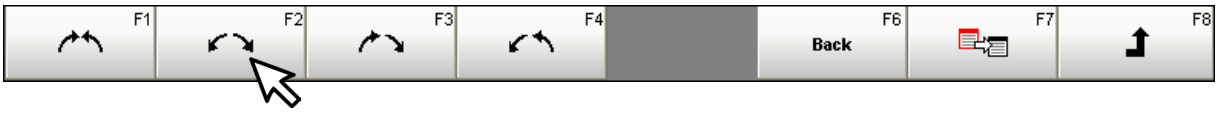


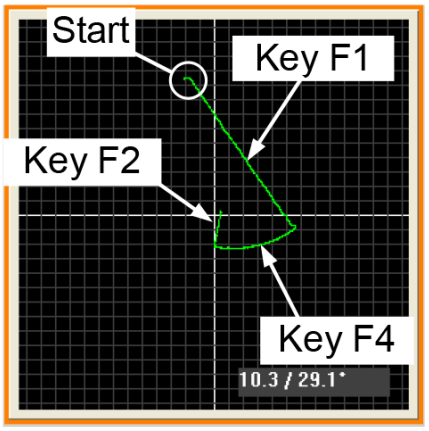
Both balancing weights are moving to or apart each other.

Same as before, but with opposite turning direction.

Both balancing weights are moving equally in the same direction.

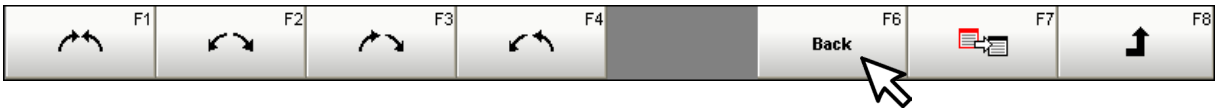
Same as before, but with opposite turning direction.





Manual Balancing is particularly comfortable in the Coordinates view. At this view, the unbalance is represented as a vector.
The aim is to bring the unbalance to the centre of the coordinate system = 0 µm/s.
After clicking or pressing one of the four arrow buttons, you see the consequence immediately.
In the lower right window, the unbalance is displayed in units of µm/s (**without Offset!**) and an internal relative measuring angle.
When you move the cursor arrow into the **Coordinates** view, the cursor arrow changes to a magnifying glass. When clicking with the RIGHT mouse button you zoom out, when clicking with the LEFT mouse button you zoom in.

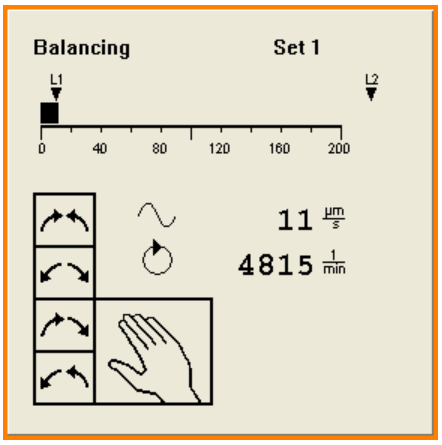
N.B.
Only one arrow key may be operated at a time!
You must try to move the two balancing weights in the direction which reduces the unbalance reading to a minimum.
When pressing an arrow key and the unbalance increases, then choose the key with the opposite turning direction.
It should be realized that any change in unbalance of the machine would lag a little behind the movement of the balancing weights. Therefore, any movement of the balancing weights should be performed in short “bursts” to evaluate the effect of the balancing weight movement.
If the unbalance remains almost constant when pressing any arrow key or an acceptable “remaining unbalance” cannot be achieved, the spindle may be in resonance. Then a check using the M600x UP Extra-Function SPECTRUM (if licensed) is highly recommended.
Exit the Manual Balancing function by pressing or clicking on key [Back]. You return to the standby Automatic Balancing Mode.



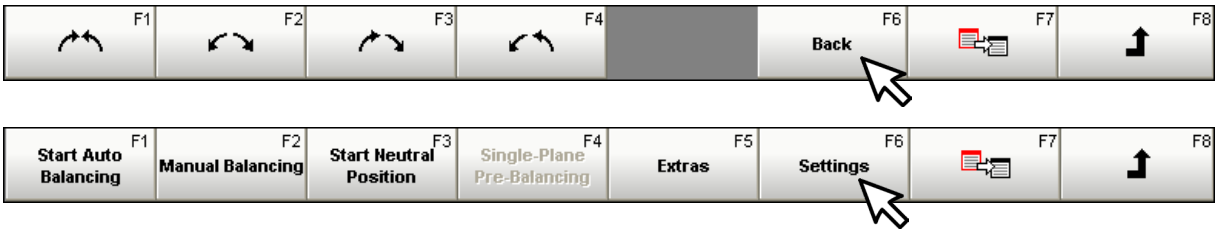
10.4 *Setting the Unbalance Offset*

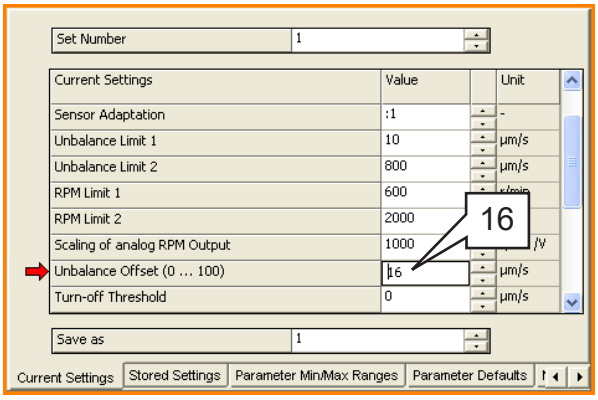
N.B.
The following setting determines essentially the monitoring function of the M600x UP. Only trained staff should therefore perform this setting.

- The Unbalance Offset setting suppresses background vibration coming from neighbouring machines or caused by the machine structure.
- Determine the Unbalance Offset in periods of maximum environmental noise and background vibrations.
- Only when installing new neighbouring machines, changing motor drives, bearings, or position of the Acceleration Sensor (magnetic mount) this setting of the Unbalance Offset has to be repeated!



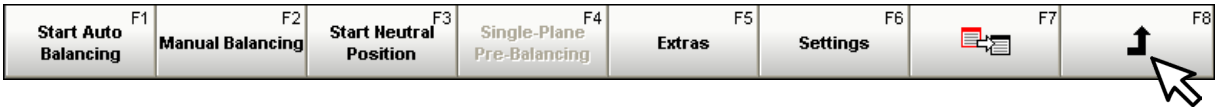
Start the machine tool and run the wheel at an operating speed not less than 300 rpm.
Turn on the coolant flow and all secondary machine systems.
In order to adjust the Unbalance Offset properly never allow the wheel is in contact with the work piece or dresser!!
Try to balance the tool spindle in the operating mode **Manual Balancing** or **Auto Balancing** (refer to“6.10.2 Manual Start of the Automatic Balancing Function” on page 103) as good as possible (residual unbalance = 11 µm/s in this figure example).
If no more reduction of the unbalance is possible, it can be assumed that this is a residual value of unbalance or vibration. It is caused by the machine structure, its foundation or adjacent machinery and therefore cannot be compensated by the Balancing System.
Record this residual unbalance (here 11 µm/s)!
To set the Unbalance Offset, first press or click on [Back] and then on [Settings].





Highlight the line “Unbalance Offset” using the Down key [▼].
With the [+] or [-] key set an Unbalance Offset of residual unbalance plus 5 µm/s!
In our example: When balanced, the recorded residual unbalance was 11 µm/s, now add 5 µm/s and set “Unbalance Offset” to “16 µm/s”.

N.B.
Perform the setting of the Unbalance Offset carefully. A great Unbalance Offset value leads to an incorrect unbalance display. This results e.g. in a delayed signal “Unbalance-Limit 1 or 2 exceeded”.
With the Down key [▼] highlight the line “Save as”. With the [+] or [-] key set the Set number as above or a new Set number and confirm the Unbalance Offset by pressing or clicking on the [OK] key.
You return to the stopped Automatic Balancing Mode screen.
If you are using several Sets, the Unbalance Offset has to be found and set for every Set Number individually.



If you are clicking or pressing on the key Return [F8] you return to the beginning of the Balancing program.

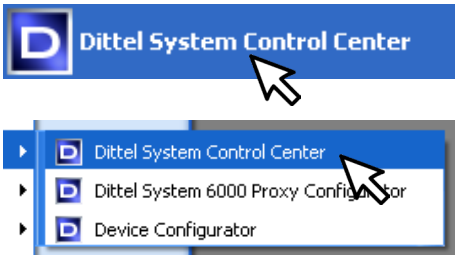
11 AUTOMATIC BALANCING FUNCTION

This Section contains a description when operating the Balancing Module M600x UP the first time in the automatic BALANCING FUNCTION.

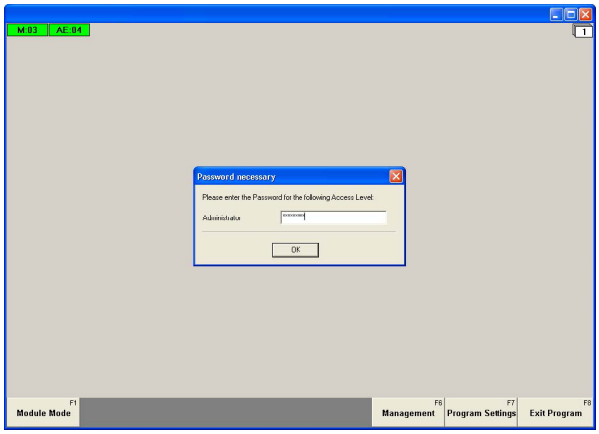
N.B.
After wheel replacement and worst case position of the balancing weights in the balancing head, an inadmissible unbalance may occur. Therefore, we recommend to drive the balancing weights to their neutral position before start-up the spindle.
Automatic Balancing should be performed with the machine running, and coolant flowing, but **not while the wheel is in contact with the work piece**. The process of grinding a part, dressing the wheel, moving the wheelhead, etc. can introduce vibrations into the machine which are unrelated to wheel unbalance.
Attempting to balance during such processes will not work, and will have detrimental effect on the grinding or dressing results.
During grinding or feeding, a distorted unbalance reading may be displayed on the screen. To blank this reading, feed a static HIGH signal from the machine CNC control to pin 19 of connector # 2 or equivalent via PROFIBUS/PROFINET (reading “0 µm/s”).
For the manually started Automatic Balancing Function the “Standard Balancing View” should be selected to watch the unbalance, speed, error, etc.

11.1 *Prerequisite*

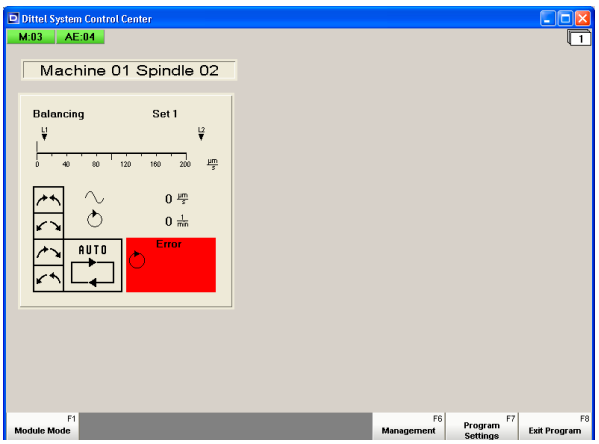
- **For Balancing Heads with Neutral Position ONLY: The machine tool spindle is spinning with less than 72 rpm or is standing still!**
- A Balancing Module M600x UP is installed, pre-set (Offset, Limits, etc) and properly powered (LED # 4 lights),
- On your Computer or Automation system the DSCC Software is installed and operating,
- Proximity Switch, Acceleration Sensor and Transmitting Coil are mounted at the machine and connected to the M600x UP Module,
- A suitable mechanical Balancing System is fitted in or at the machine spindle.



Start the Program on your Automation System or computer by clicking on button Start and then on symbol “Dittel System Control Center”.
Or start the Program by clicking on buttons Start / Programs / Dittel System 6000 and finally on the symbol “Dittel System Control Center”.
In the SINUMERIK® HMI-Environment you can start the DSCC Program by pressing the appropriate softkey.



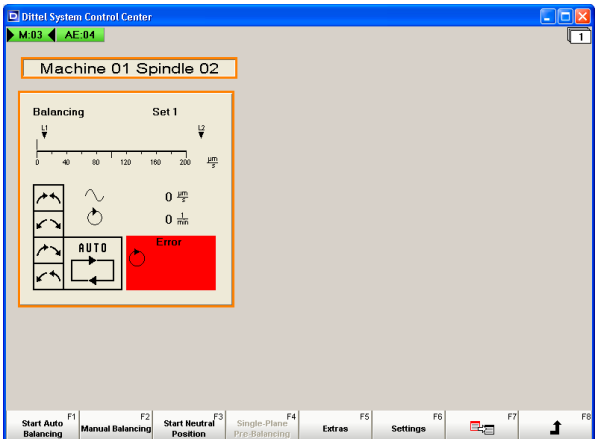
In the following example, the Automation System finds two Modules.
To start the Automatic Balancing Function the opposite or the following screen should open:
The access right shown corresponds to the setting in “6.7.2.4 General Settings: Access Rights” on page 65.
If you have not allocated any password yet (see “6.11.1 Placing the Access Rights” on page 107) click on [OK] or press the key [Enter] on your computer keyboard or [Input] on the SINUMERIK® keypad.
Otherwise enter your password and confirm by clicking on key [OK] or pressing the [Enter] / [Input] key.
The next screen opens.



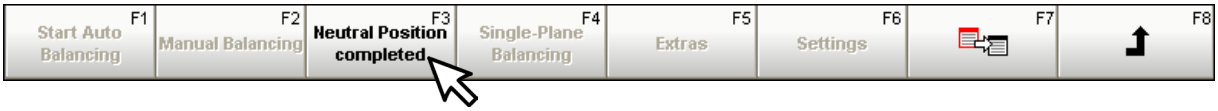
Or this screen opens immediately (number of views depends on your setting).
It is displayed:

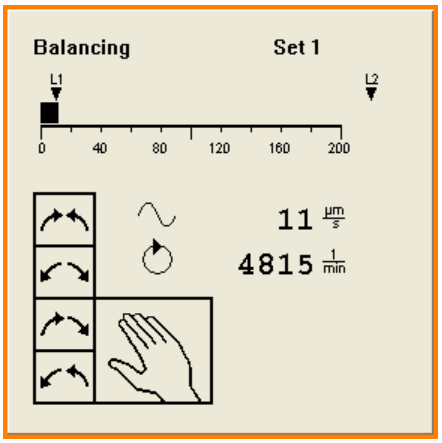
- the module Set number (here 1),
- the settings of the module Set 1 (L1, L2),
- the actual Unbalance (0 µm/s)
- the spindle's speed (0 1/min),
- the Error message "speed" (speed of spindle is less 72 rpm, only for Neutral Position).

Click or press on the key [Module Mode].



The Module Address **M:03** will be highlighted, as well as the Standard Balancing view and the key assignment changes.
If wanted, press or click on the key [Start Neutral Position] and wait till the balancing weights are into the neutral position (Symbol ). Exit by clicking or pushing on the key [Neutral Position completed].





Start the grinding machine and run the wheel at an operating speed not less than 300 rpm.
Turn on the coolant flow and all secondary machine systems.
In order to balance properly never balance during grinding or dressing!
Press or click on the key [Settings] and select the Set number under which the Balancing Process should be performed.
Confirm by pressing the key [OK].

The Balancing Module M600x UP is in the stopped Automatic Balancing Mode (standby).
It is displayed:

- the Set number (here: Set no. 3)
- the Limits 1 and 2 (L1, L2),
- current unbalance level (here: 338 µm/s),
- current speed (here: 3372 rpm)

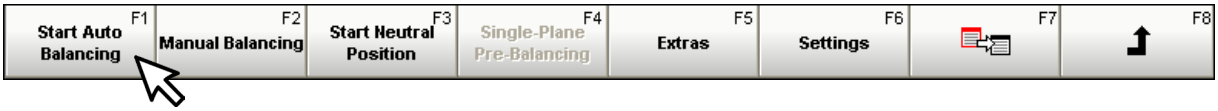
No red Error message should be displayed:

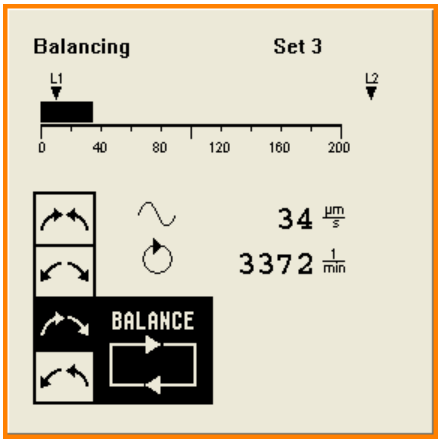
- no speed-symbol,
- no unbalance-symbol,
- no transmitting-symbol,
- no clock-symbol!

If an Error message is visible anyway, refer to Appendix B, Troubleshooting Guide.

11.2 *Manual Start of the Automatic Balancing Function*

To start the Automatic Balancing Function manually, press or click now on key [Start Auto Balancing].

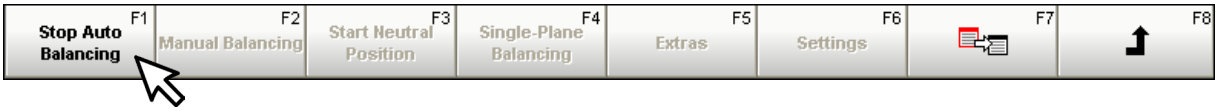


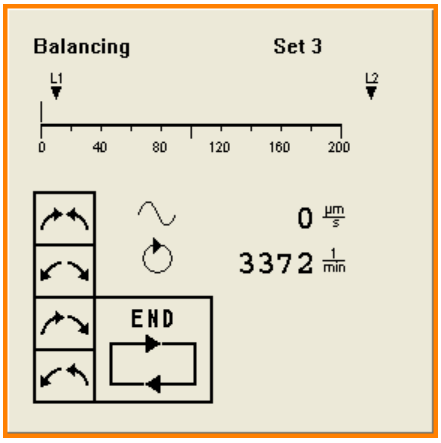


Now the Balancing Module M600x UP starts to balance automatically using the parameters e.g. saved in Set 3.
During balancing you see on the screen:

- The direction indication of the balancing weights changes depending on balancing mode.
- The unbalance decreases, visible on the digital and bar graph display.

The balancing process may be aborted any time by pressing or clicking on the [Stop Auto Balancing] key, if the keypad is not inhibited by the machine CNC control.



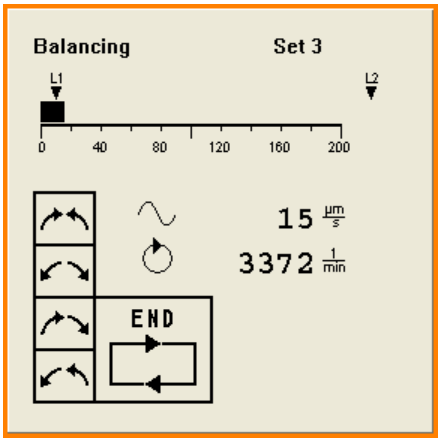


Balancing of the M600x UP continues until the pre-set zero mark (Unbalance Offset plus Turn-off Threshold) is reached. The screen changes as follows:

- The direction indication of the balancing weights gets blank (the motors driving the balancing weights switch OFF),
- The digital indication shows “0 µm/s”,
- The symbol ‘**BALANCE**’ changes to ‘**END**’,
- The key [Stop Auto Balancing] becomes the key [Start Auto Balancing] again, the keys [Manual Balancing] and [Start Neutral Position] are available again.

The balancing process may be aborted any time by pressing or clicking on the [Stop Auto Balancing] key, if the keypad is not inhibited by the machine CNC control.

Depending on setting in the Tab “M Parameter” the unbalance is either displayed again after exceeding Limit L1 (**Blank Unbalance Indication** → **True**) or the unbalance reading is visible continuously (**Blank Unbalance Indication** → **False**).



If the unbalance increases after several dressing or grinding cycles the manually started Automatic Balancing process can be repeated by pressing or clicking on the key [Start Auto Balancing] at a suitable time (time between grinding or dressing cycles).

11.2.1 *Optimizing the Balancing Process*

If the Balancing System requires too much time to achieve a balanced wheel, or when the System does not reach the 0-point, the following parameters in the Tab “Current Settings” can be changed (see “6.8.3 Module Settings” on page 81):

- Balancing Strategy,
- Motor Speed Multiplier,
- Turn-off Threshold (if it is allowed by the quality demand).

For the first test balancing cycles, the Turn-off threshold should be set to “0 µm/s”.
To determine the correct setting of the Balancing Strategy and Motor Speed Multiplier, first press or click on the key [Manual Balancing] and with the arrow keys unbalance the system to a certain amount. Then press or click on [Start Auto Balancing] and observe the time and steady progress to reach the balancing point.
Again unbalance the system manually, change Balancing Strategy or Motor Speed Multiplier, save the new setting temporary by pressing the [OK] key and initiate a manually started Automatic Balancing Cycle.
Repeat this quick check a few times, each changing the Balancing Strategy or Motor Speed Multiplier. Find out the best combination for maximum balancing speed and accuracy.
Save the best setting under your desired Set Number(s).
Increase the Turn-off Threshold only when surface quality is not a problem (e.g. rough grinding). On the other hand, the higher the Turn-off Threshold is set, the less time the Balancing System will typically require to achieve balancing! You can use the Set Numbers to match the different grinding or dressing processes to certain Turn-off Thresholds.

11.3 *Automatic Balancing Function started by the Machine Control*

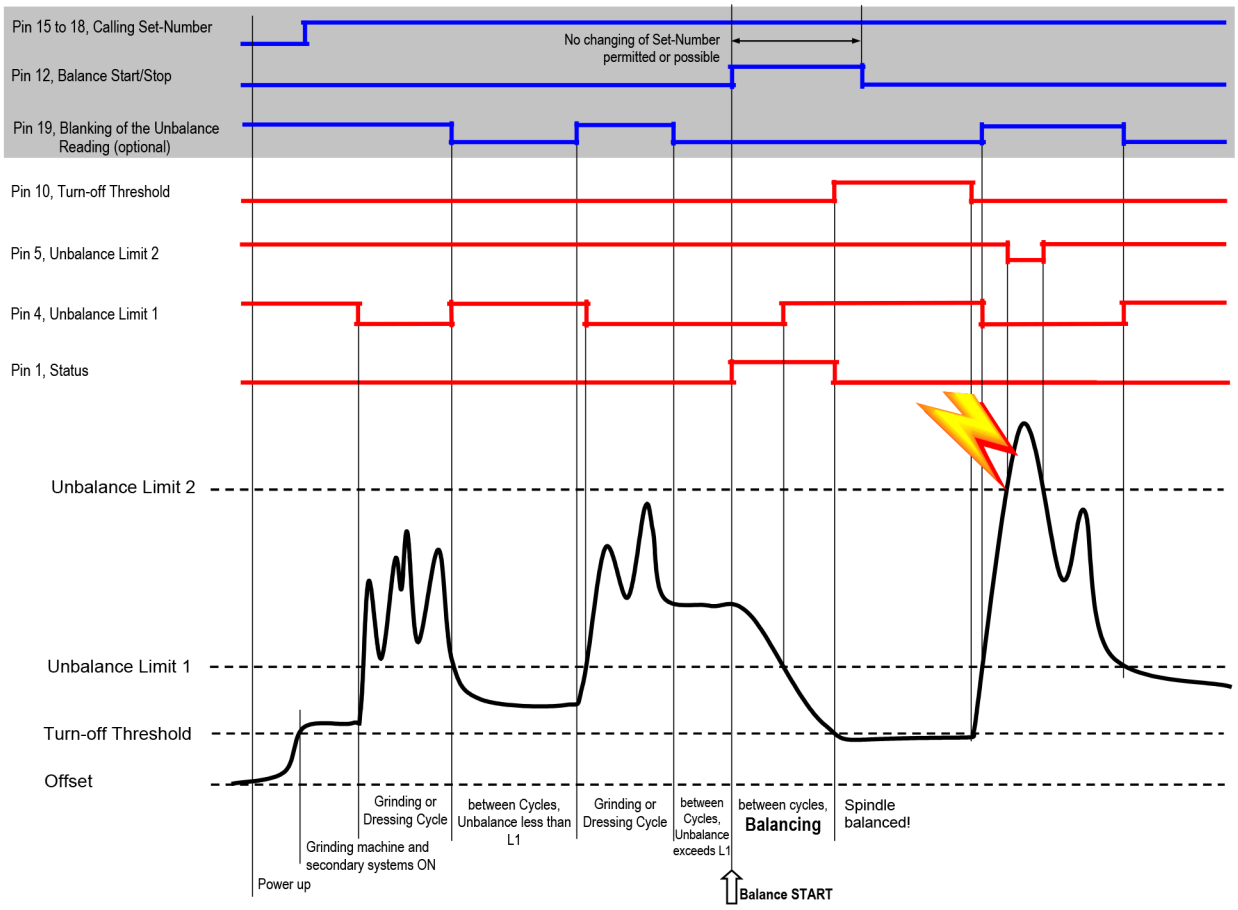
N.B.
When hardwired to the machine CNC control via connector # 2 or equivalent via PROFIBUS interface connector # 13 the Balancing Module M600x UP works completely in stand-alone, i.e. no manual intervention or display is necessary.

11.3.1 *Prerequisite*

- A Balancing Module M600x UP is installed, connected to the machine CNC control, has already successfully been put into operation and is properly powered (LED # 4 lights green),
- Proximity Switch, Acceleration Sensor and Transmitting Coil are mounted at the machine and connected to the M600x UP Module,
- A suitable mechanical Balancing System is fitted in or at the machine spindle.

11.3.2 *Hardwire Interface # 2: Timing Diagram*

N.B.
After changing a grinding wheel and before starting the spindle, it is recommended to drive the balancing weights of the Balancing System into Neutral Position.
During Automatic Balancing NO change of the Set Number is permitted (a change is not recognized by the unit) or possible!



N.B.
If you would like to watch the function of the Balancing Module M600x UP, activate the Balancing Standard view or at least one of the Balancing Reduced views.
The signals at interface connector # 2 given above are equivalent for the PROFIBUS/PROFINET interface.

Power up

The first action of the machine CNC control is - after starting up the machine tool spindle - to call one of the 15 memory sets under which the parameters are stored to perform the following Balancing Process. For this, the four inputs Set Number 1 to Set Number 4 have to be set correspondingly (refer to paragraph Connector # 2, truth table, or “D.1.3 Truth Table to select or confirm the appropriate Memory Sets 135” on page 7). With the setting of the Set Number, the Balancing Module M600x UP gets active.
After power up and switching on coolant flow, secondary systems etc, the machine tools spindle reaches its nominal speed. The unbalance detected is below the Unbalance Limit 1 stored in the selected memory set.

1st Grinding or Dressing Cycle

During a grinding or dressing cycle, the unbalance may rise above the pre-set Unbalance Limit 1. This is permitted but the machine control may not activate a Start command to balance the spindle.

1st Time between Grinding orDressing Cycle

At a break between grinding or dressing cycles the machine CNC control examine by interrogation the Unbalance Limit 1 signal (connector # 2 / pin 4) whether there is need to balance the spindle or not. Since the unbalance is below Unbalance Limit 1 (HIGH signal at connector # 2 / pin 4) no Balancing Start command is given.

After a few Grinding or Dressing Cycles

At a break between cycles the machine CNC control examine again whether there is need to balance the spindle or not by querying the Unbalance Limit 1 signal (connector # 2 / pin 4). Now the unbalance is above Unbalance Limit 1 and a LOW signal is applied at connector # 2 / pin 4. The machine CNC control gives a Balancing START command (HIGH signal) to connector # 2 / pin 12. Simultaneously the Status signal at connector # 2, pin 1 goes HIGH to prevent the machine CNC control from starting any process like grinding, dressing, feeding etc. The Balancing Module M600x UP starts balancing the machine tool spindle. After the Turn-off Threshold or Offset (when turn-off threshold is set to 0) is reached, the M600x UP applies a HIGH signal to connector # 2 / pin 10 to report a successfully finished balancing process. Simultaneously the Status signal at connector # 2, pin 1, goes LOW. After that, the machine CNC control stops the balancing process by applying a LOW signal to pin 12 of connector # 2. Hereby the Balancing Cycle is complete.

Optionally blank an obviously wrong unbalance display during grinding or dressing cycles by feeding a HIGH signal to pin 19 of connector # 2.

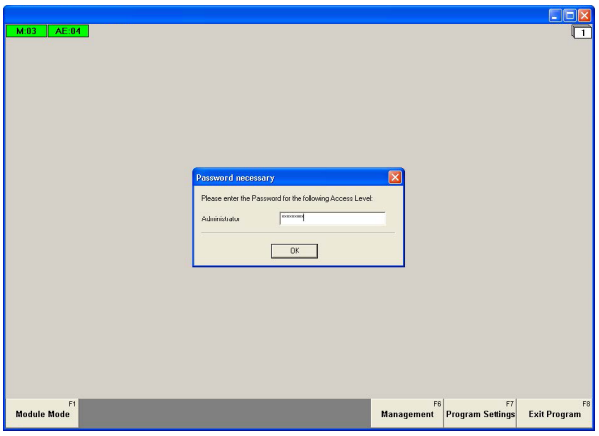
11.4 *Special Features*

11.4.1 *Placing the Access Rights*

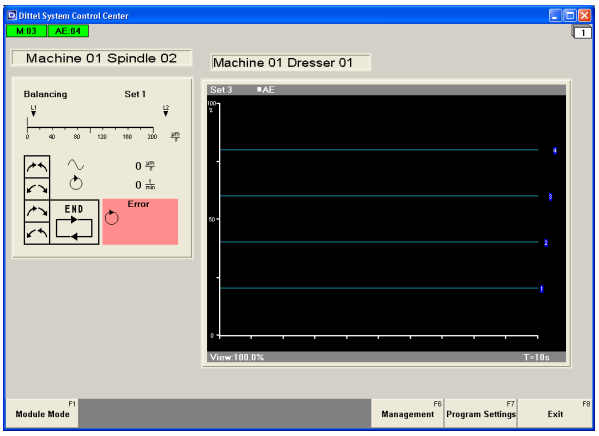
N.B.
Ex-factory, the DSCC Software is shipped with Access Level Administrator and without password, except for Access Level Service.
Passwords and access rights are valid for all DS6000 UP Modules connected to the Computer or Automation System. An individual placing is not possible.

After completion of all settings and the first successful operation attempts, the DS6000 UP Module(s) can be locked or unlocked for the respective user group.

11.4.1.1 *Placing a password the very first time*



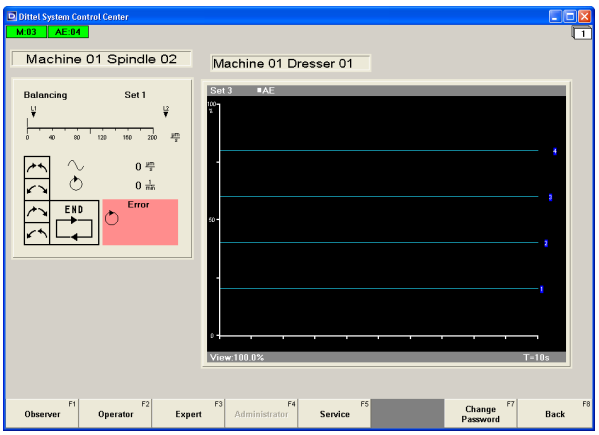
If you have activated “Ask for Password after Program Start” in the options menu **Access Rights** (see paragraph “6.7.2.4 General Settings: Access Rights” on page 65), the opposite screen opens on every program start.
Since you have not entered a password, click on the key [OK] or press the key [Enter] on your keyboard or [Input] on the SINUMERIK®.
The next screen opens.



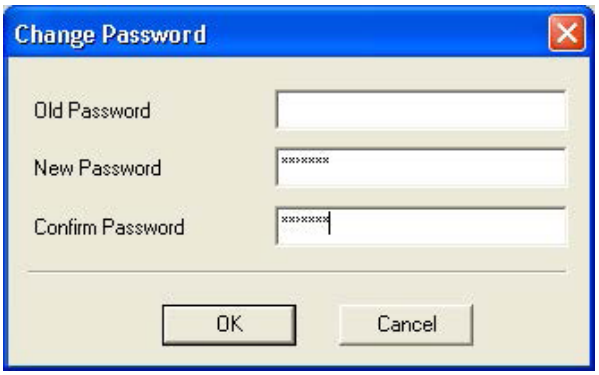
If you have **NOT** activated “Ask for Password after Program Start” in the options menu **Access Rights** (see paragraph “6.7.2.4 General Settings: Access Rights” on page 65) the opposite screen opens on every program start.
It opens always with Display Layer 1 (if not changed) and its view(s) which were created or active before last leaving the DSCC Program.
The Module View is just an example.

To enter a password press or click on key [Management] / [F6]

and then the key [Access Rights] / [F1]



The key assignments change to enter or to change a password, or to change the Access Level. The current Access Level is highlighted
To enter a password the **very first time** – in this example for **Administrator** – click or press the [Change Password] key.



The DSCC Software is shipped ex works without Password.
Therefore, with the keyboard or keypad enter your password only in the “New Password” screen.
Enter again your Password in the “Confirm Password” screen and then click on the [OK] key or press the [Enter] / [Input] key.

Execute the entered Password by clicking on the [OK] key or pressing the [Enter] / [Input] key.

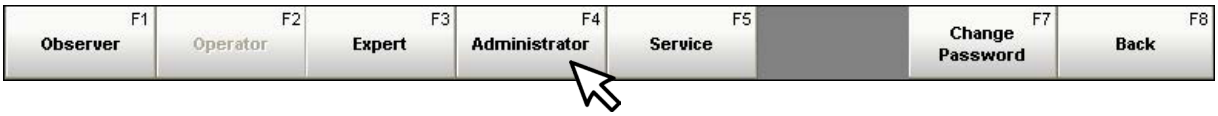
You can allocate a separate Password for every access level. Click or push on the desired access level and then again on the key [Change Password]. Repeat the procedure for the new password as described above.

11.4.1.2 *Change actual Access Level*

When the Access Level shall be changed from a **high** access level to a **lower** access level, e.g. from “Administrator” to “Operator” it is sufficed to click or to press on the softkey in question.

Confirm the new Access Level by clicking on the [OK] key or pressing the [Enter] / [Input] key.

When the Access Level shall be changed from a **low access** level **to a higher access level**, e.g. from “Operator” to “Administrator” click or press on the softkey in question.



With the keyboard or keypad, enter the Administrator Password. Confirm by clicking on the [OK] key or pressing the [Enter] / [Input] key.

Execute by clicking on the [OK] key or pressing the [Enter] / [Input] key.

From now on you have all access rights of an Administrator.

11.4.1.3 *Change your Password*

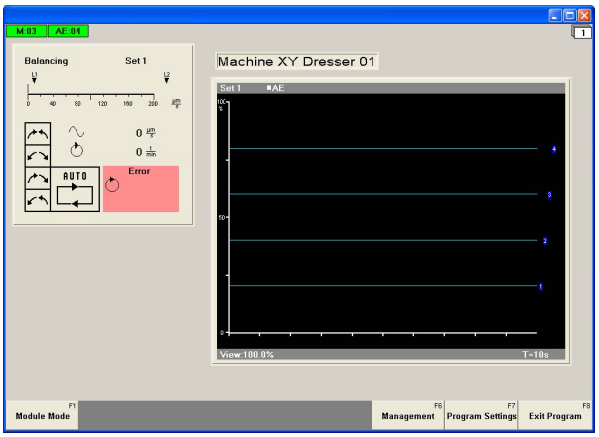
If you want to change your password of the current Access Level (highlighted, here Administrator) click or press on the softkey [Change Password]:

With the keyboard or keypad, enter your “Old Password” and then your “New Password” into the respective screen.
Repeat your “New Password” in the third line.
Confirm by clicking on the key [OK] or pressing the [Enter] / [Input] key.

Execute by clicking on the key [OK] or pressing the [Enter] / [Input] key.
From now on, the new password is valid for the current Access Level.

11.4.1.4 *User-defined Function Keys*

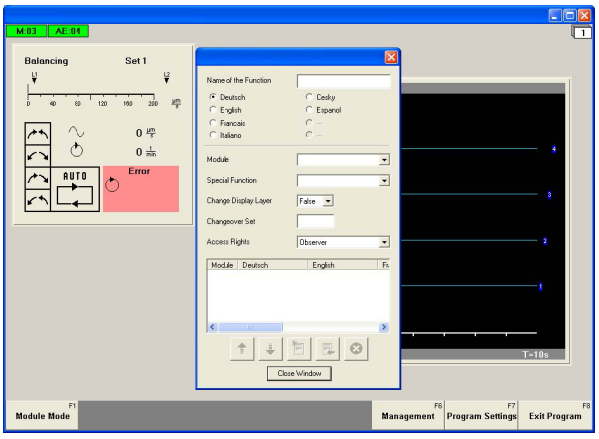
The DSCC Program gives you the opportunity to create user-defined Function Keys. This allows a fast access to the respective Module, the Display Layer or the Set number.



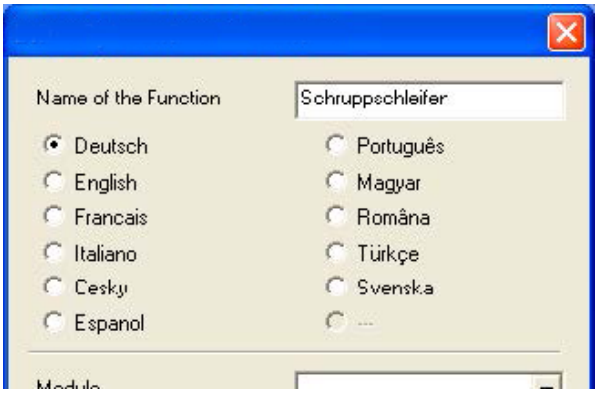
When restarting, the program opens always with Display Layer 1 (if not changed) and its view(s) which were created or active before last leaving the DSCC Program.
This Module View is just an example.

To create user-defined Function Keys press or click on key [Management] / [F6]

and then the key [Setup Functions] / [F2].



To create a user-defined Function Key a separate setup screen opens.

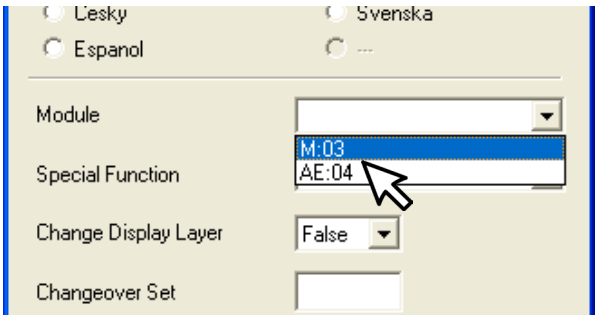


Name of the Function

With the keyboard, enter the desired name of the function, e.g. Schruppschleifen (rough grinding). This name of the function appears later on the user-defined Function Key, too.
If you enter only one name (no matter in which available language), then the user-defined Function Key shows the same name in every language.

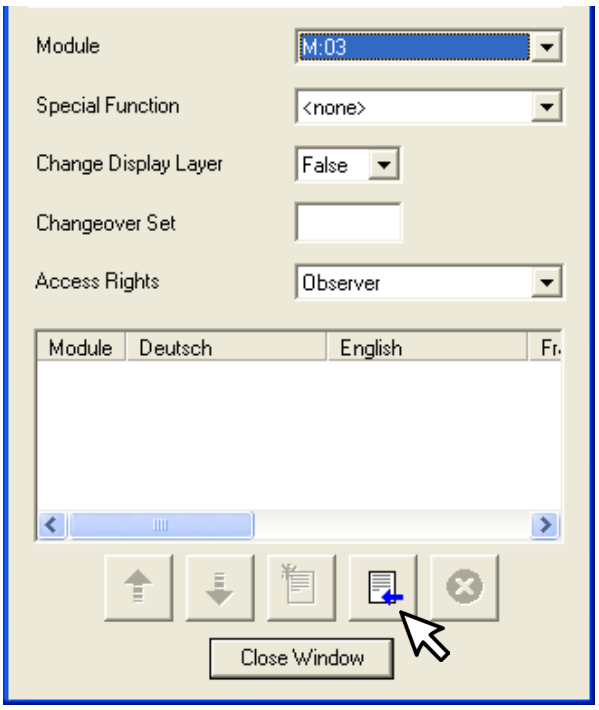
Language

You can assign a separate name of the Function in every available language by selecting a language.
If you enter the name in every language, then the user-defined Function Key shows the respective name of the Function when switching over the language.
Not filled names are displayed with the English name.

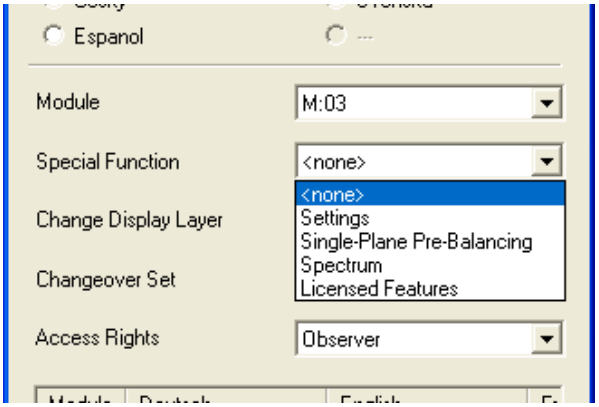


Module

In the context menu, select the wanted module, here e.g. the Balancing Module M600x UP with the address 03.

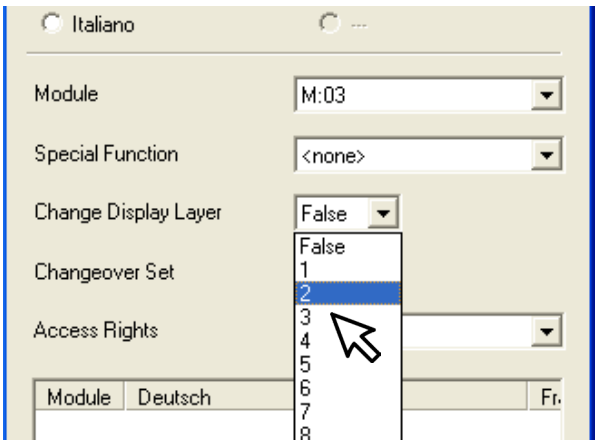


From now on the **Save** key is active. By clicking on the **Save** key the entered Function name is displayed in the screen below. Then any further setup of the user-defined Function Key is no longer possible.



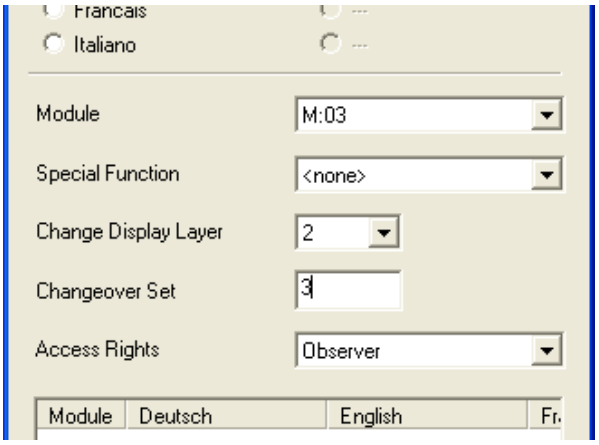
Special Function

In this context menu, select the function in which the Module – selected above – should start after pressing the user-defined Function Key. Only available functions are displayed.
When the setting <none> is selected the Module starts with its activated Module View.



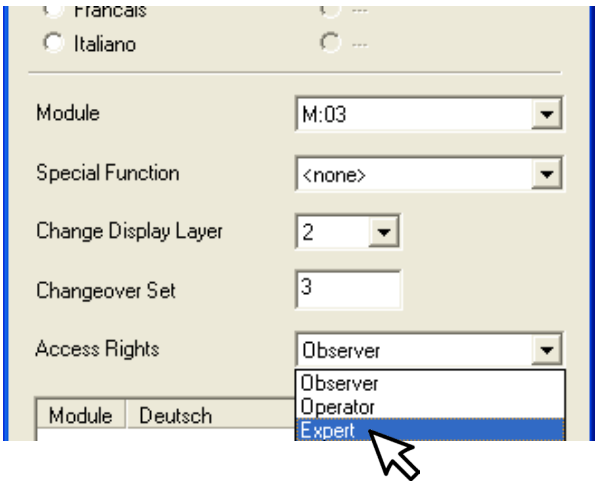
Change Display Layer

This setting is only available when **Special Function** is set to **<none>**!
In this context menu, select the Display Layer on which the Module – selected above – should start after pressing the user-defined Function Key. For this purpose, the Module must be activated (visible) on that Display Layer.
When the setting False is selected the Display Layer does not change.



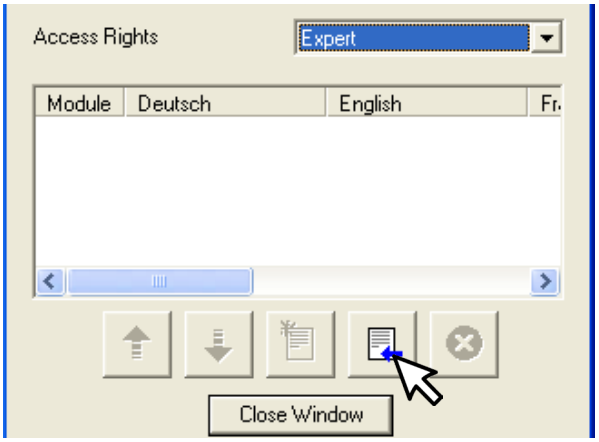
Changeover Set

With the keyboard, enter the Set Number in which the Module should start after pressing the user-defined Function Key.
At an empty screen, the actual Set Number does not change.

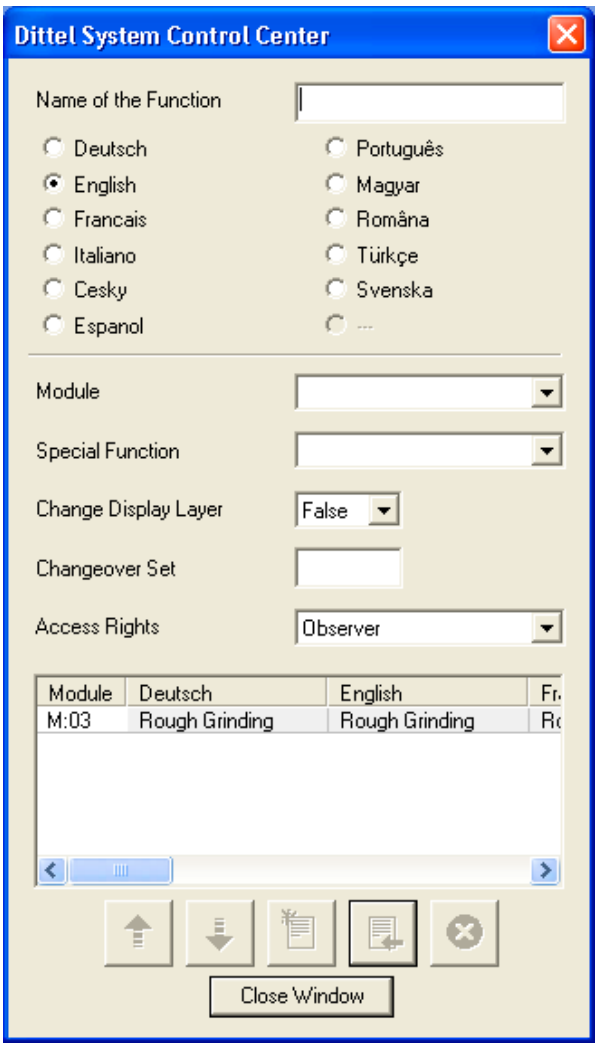


Access Rights

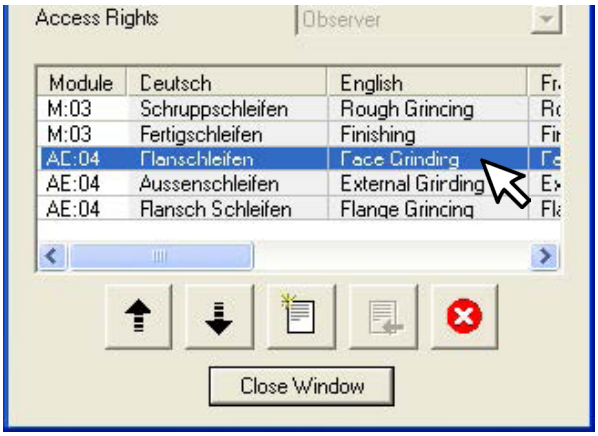
In this context menu, select the Access Right under which the user-defined Function Key may be operated.
Example:
When you choose **Observer**, then the Function Key can be operated in all Access Levels assigned to the Module(s).
When you choose **Administrator**, then the Function Key can be operated only when the Access Level **Administrator** is assigned to the Module(s) (see paragraph “6.11.1 Placing the Access Rights” on page 107).



With this setting, the setup of the user-defined Function Key is complete.
To save the settings click on the ‘**Save**’ key.



The setup is stored and the screens, to create another user-defined Function Key, are ready for a new input.



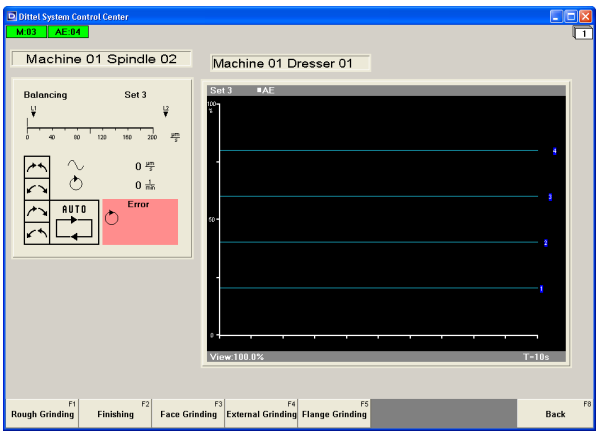
Example: Create for every Module user-defined keys as many as you like. See example.

To organise the list the following keys are used:

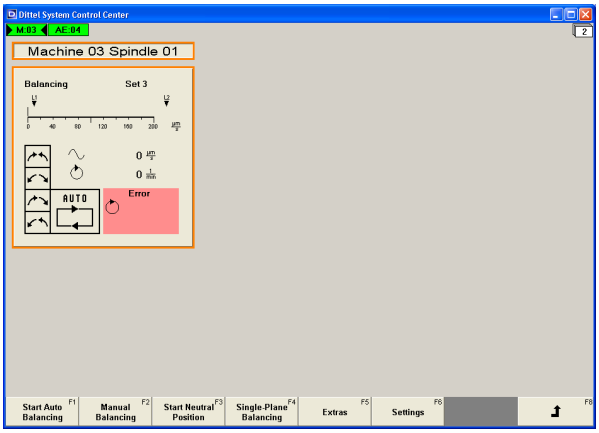
With the **Up** or **Down** arrows keys the lines and therefore the Function Keys are changed in their order.
Highlight the line in question and move it with the Up- or Down key.

With the **New** key, all input fields are cleared and ready to create a new user-defined Function Key.

With the **Delete** key, a user-defined Function Key can be deleted.
Highlight the line in question and then click on this key.



When you have selected **Functions** as **Starts with Menu** (**Program Settings - General Settings - Menu Bar - Starts with Menu**) the program starts with the opposite screen showing the user-defined Function Keys.



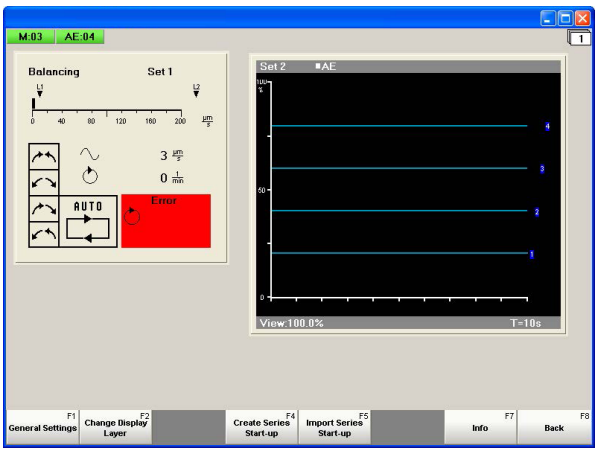
So if you press, for example, Function Key **Rough Grinding** the screen changes into Display Layer 2, and the Balancing Module **M:03** gets active with Set number 3 (refer to the settings above).

11.4.2 *Series Start-up*

11.4.2.1 *Creating a Series Start-up File*

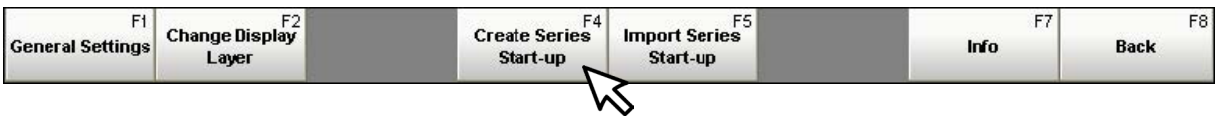
The DSCC Program gives you the opportunity to save all **stored** settings of all modules connected to the Automation System or Computer in a Series Start-up File, either as a backup file or to transfer it into other systems.

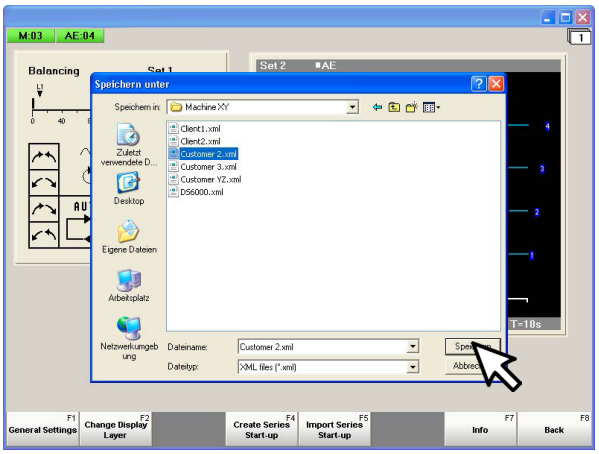
To create a Series Start-up File press or click on the key [Program Settings] or press the function key [F7].



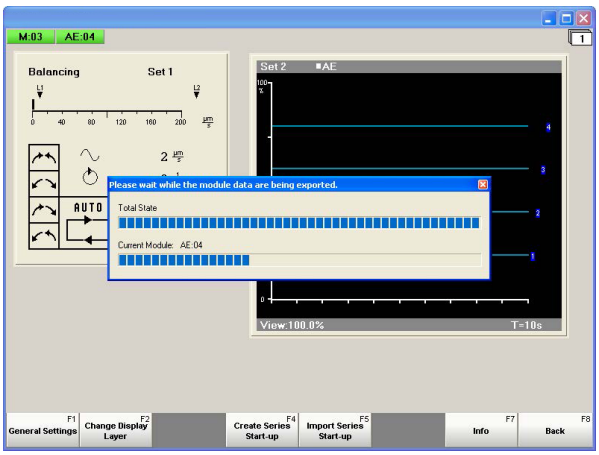
Example:
These settings like language, passwords, module views, display layers etc. should be transferred to a second or further machine(s).

Continue by pressing or clicking on key [Create Series Start-up] or press the function key [F4].





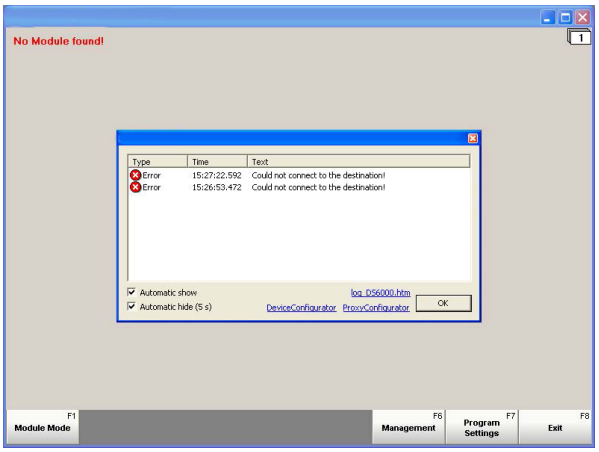
A Save as screen opens.
Open the directory **Save in** and click on **Network Environment** (when using a notebook), the disk drive or the folder in which the Series Start-up file shall be saved. Create a new folder if necessary.
Enter a suitable file name.
Click on **Save**.



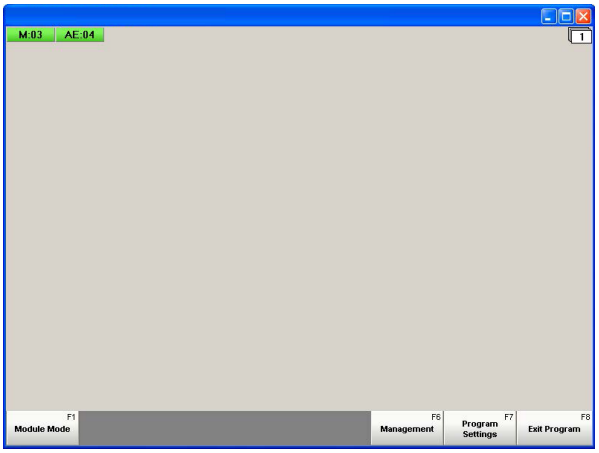
A *.xml file is created automatically. One by one the data of the Computer settings, the display layers and **stored** module settings are read out and stored.
Both the complete progress and the progress of the just current module are readable in an additional screen.
After a successful completion the additional screen closes.

11.4.2.2 *Importing the Series Start-up File*

Prerequisite:
• On your NEW computer or Automation System, the DSCC Software is installed and operational.
• All Modules are connected to the Computer or Automation System and operational (LED # 4 lights on each Module).
• The addresses of the respective Modules must be the same as in the case of the first machine (e.g. Balancing Module = M:03, Balancing Module = AE:04).
Start the DSCC program on your computer or Automation System.
If necessary, put the data carrier with the Series Start-up file in the disk drive.



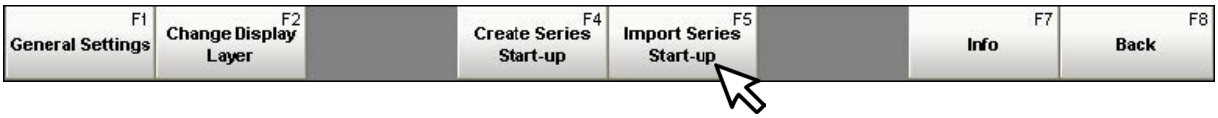
When starting the DSCC Program the very first time all messages will be in English.
If no Module is found by the Automation System or computer, for example due to wrong interface setting, the opposite screen will appear.
Confirm this message by clicking on the key [OK] or pressing the [Enter] key.

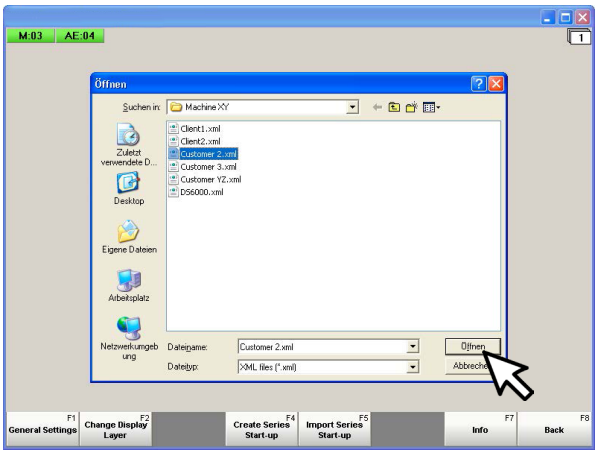


If the modules are recognized by the Automation System or Computer the opposite screen appears.

To get access to the Series Start-up File click or press the key [Program Settings] or the function key [F7].

Continue with pressing or clicking on key [Import Series Start-up] or the function key [F5].

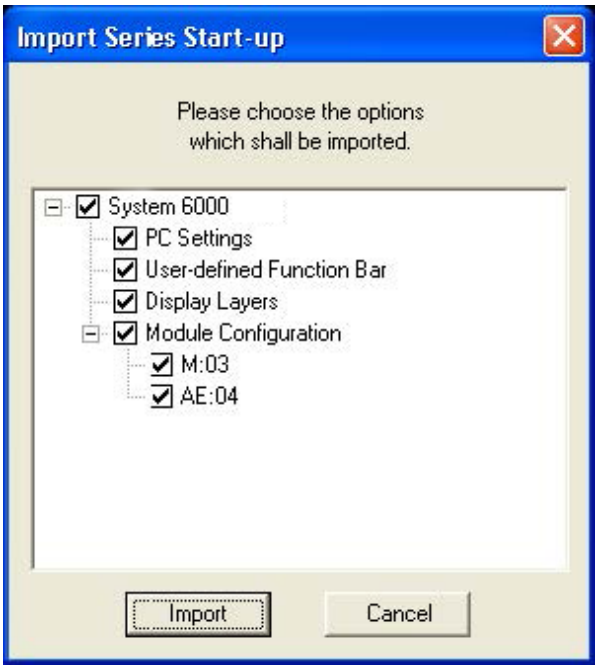




An additional screen opens.
Open the directory **Look in** and click on **Network Environment** (when using a notebook), the disk drive or the folder in which the Series Start-up File (*.xml) is contained.
Highlight the *.xml-file and then click on **Open**.

A new screen opens.

N.B.
If the Automation System or computer did NOT recognize the Modules, only the options **PC Settings**, **User-defined Function Bar** and **Display Layers** are available!



Click into the respective check box to activate or deactivate the desired options:

System 6000 UP all shown options are activated, all stored settings are imported.

PC Settings all PC/Automation System settings like language, interface and its setting, addresses etc are imported.

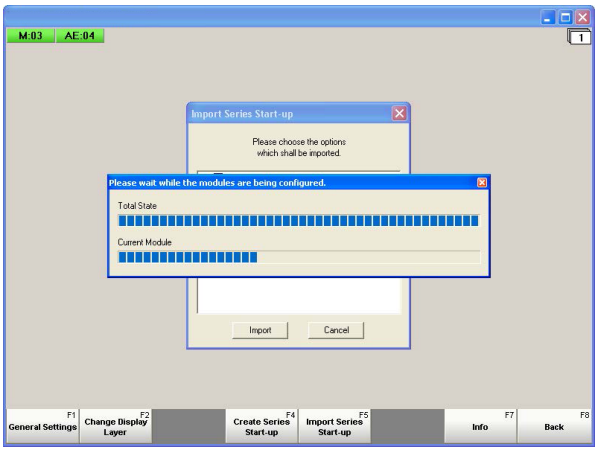
User-defined Function Bar all user-defined Function Bars are imported.

Display Layers all Display Layers are imported.

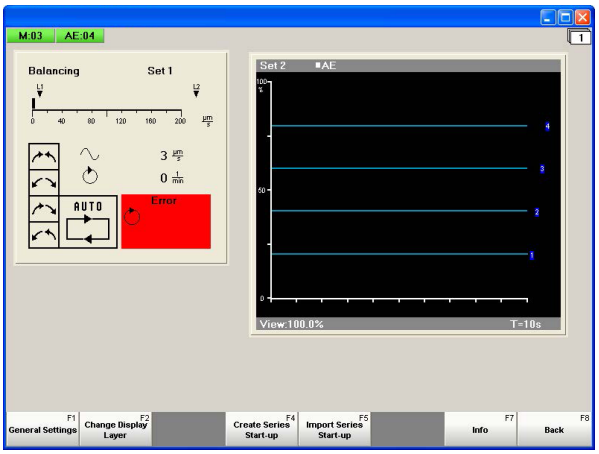
Module Configuration the Module Configuration of all or only the selected Modules are imported.

N.B.
If the modules were **NOT** found by the Automation System or computer import only the **PC Settings** (and the **User-defined Function Bar** and **Display Layers**, if selected) by clicking on the key [Import] or pressing the [Enter] key. The PC settings are imported (see figure below). A screen with green module addresses should appear (see figure with green module addresses above). If not refer to Appendix B, Troubleshooting Guide.

Repeat the import of the Series Start-up file as described above. All options should now be available. Select the Module Configuration and click on the key [Import] or press the [Enter] key.



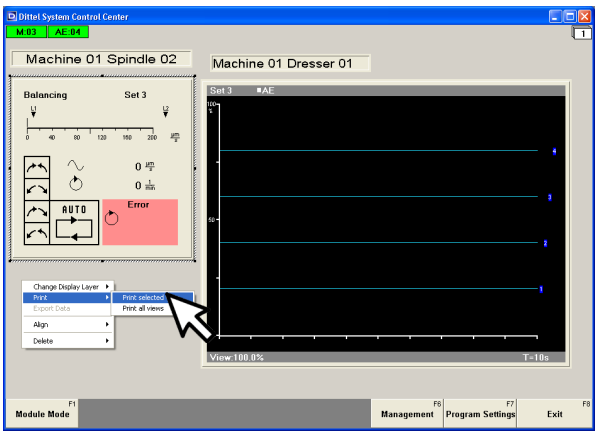
One by one the selected options are imported and saved.
Both the complete progress and the progress of the just current module are readable in an additional screen.
After a successful completion the additional screen closes.



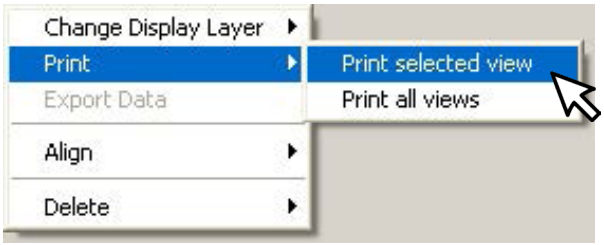
This completes the import of the Series Start-up data.
All views including all stored settings of the DS6000 UP Modules correspond exactly to the first installation.

11.4.3 *Hardcopy of the Module View or Display Layer*

For documentation or evaluation the Module View or Display Layer can be printed. A suitable printer must be connected and installed on your Automation System or Computer.

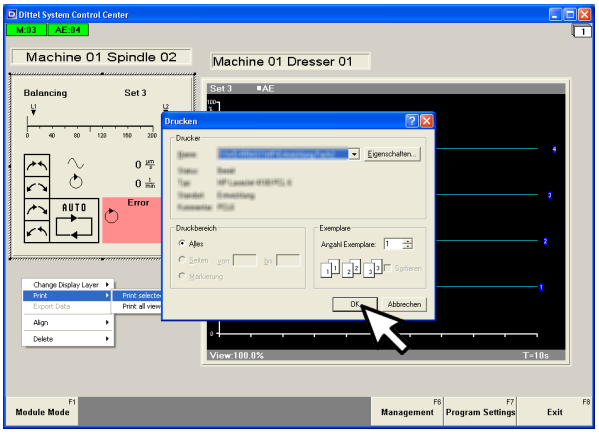


To print the Display Layer or a part of it move the mouse cursor outside a Module View and press the RIGHT mouse button. Select ‚**Print**' and a context menu opens:



Print selected view For that the Module View must be highlighted, see paragraph “6.8.2.3 Module View – highlighting, positioning and scaling” on page 78. Only a highlighted Module View is printed.

Print all views The print complies with the Display Layer view except the softkey bar.

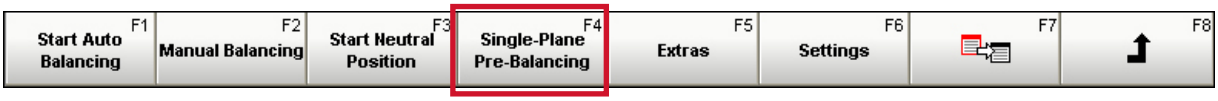


The dialog box **Print** opens.
Print as usual.

11.5 *Activating Licensed Featuresecial Features*

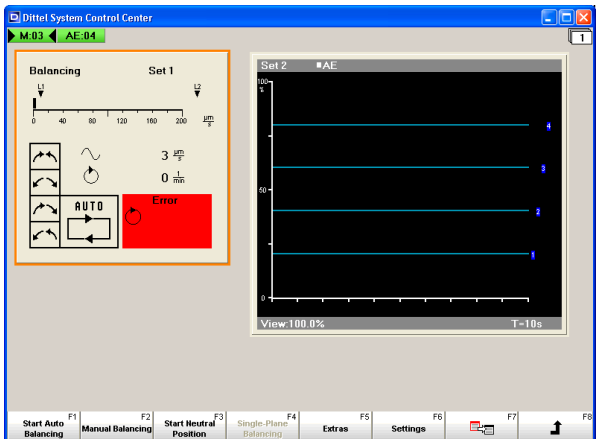
N.B.
Temporary (maximum 250 hours) or permanent activation of additional licensed features happens in the respective DS6000 UP Module. This means a separate License of its own must be applied or ordered for each module, which shall get an additional feature.

DS6000 UP supports additional Licensed Features. For example, when you order a Balancing Module M600x UP together with the “Single-Plane Pre-Balancing” function, the module will be normally provided together with the license key to be activated.
The already activated licenses are anyway visible into the software interface.

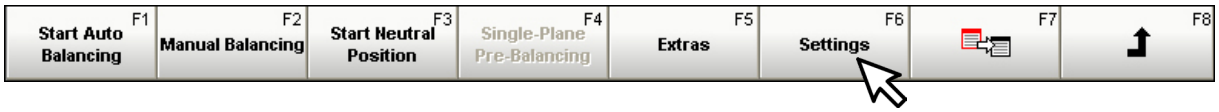


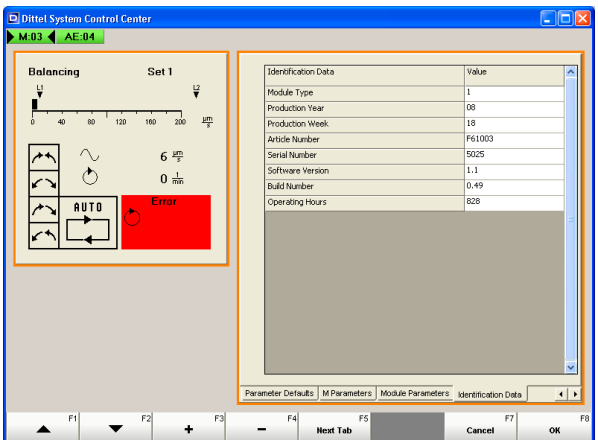
A temporary or permanent activation of licensed features afterwards is possible at every time. Order to the Sales Department of Marposs may be done by Mail, Telephone, or E-mail.
To order the activation of licensed features the following data are required:

- Description of the required licensed feature (e.g. Single-Plane Pre-Balancing, Envelope, etc.)
- Article Number of the Module (see in one of the figure below)
- Serial Number of the Module (see in one of the figure below)
- Operating Hours (only required for temporary activation, see in one of the figure below).

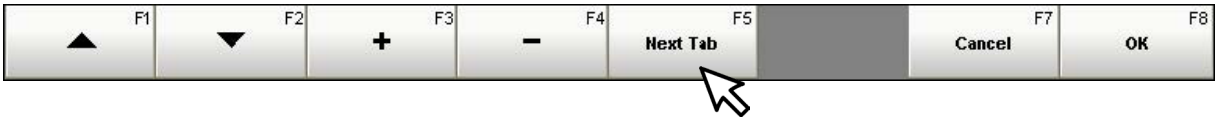


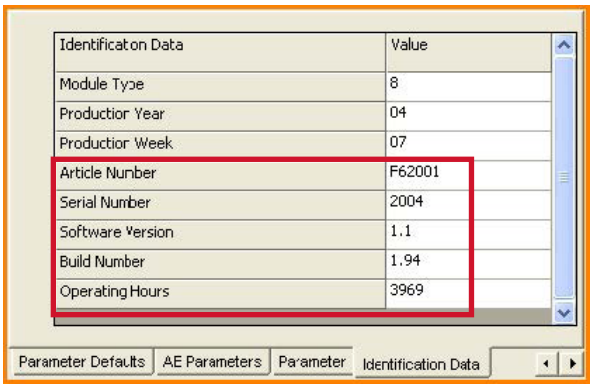
You obtain the data required (except Operating Hours) from the Module’s type plate. When the type plate is not accessible, then operate the Module, which should get the additional feature, in the Module Mode.
Click on the [Settings] key or press the [Settings] softkey.





Open the Tab ‘Identification Data’ by clicking on the [Next Tab] key or click directly with the computer mouse on tab ‘Identification Data’.

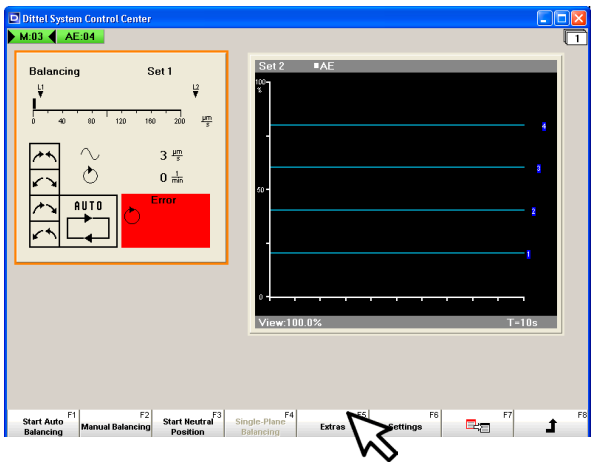




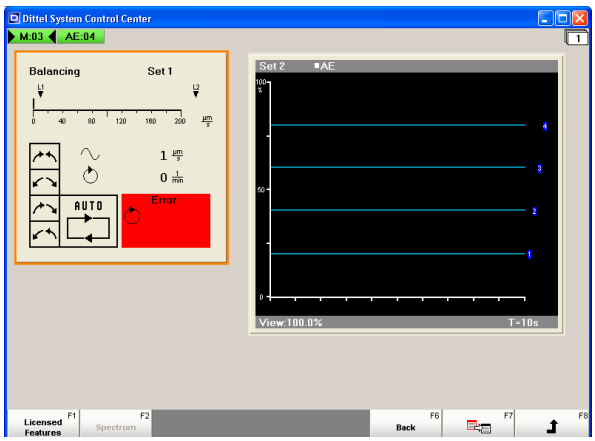
Note down
- Article Number,
- Serial Number,
- Operating Hours (required for temporary activation),

and send it together with your order.
Without these data, Marposs cannot generate a License Key or Licence File.

After you have ordered the licensed feature(s) you will get from the Marposs Sales Department a **License Key** by phone, or mail or a **License File** by E-Mail.

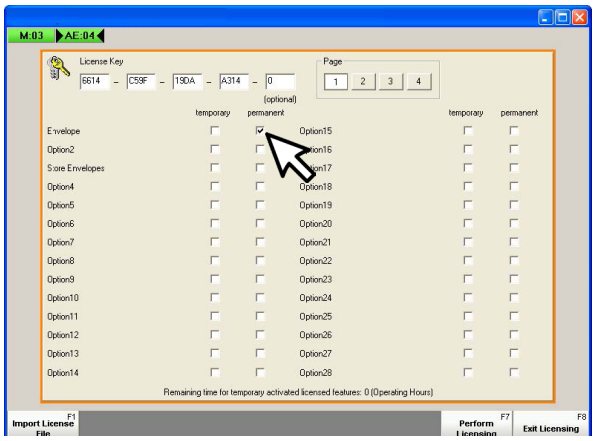


To enter the License Key or the License File operate the Module, which should get the additional feature, in the Module Mode. Click on the [Extras] key or press the [Extras] softkey.

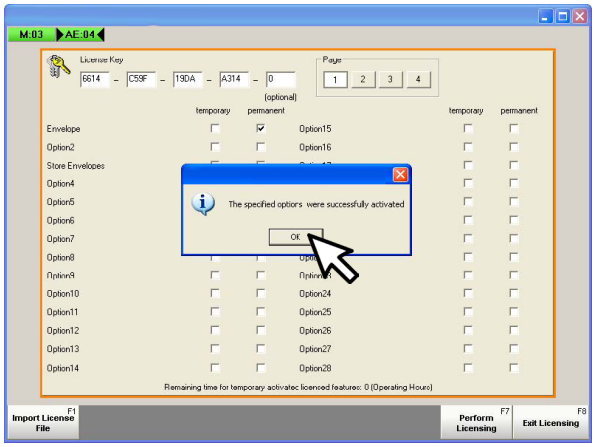


Click now on the [Licensed Features] key or press the [Licensed Features] softkey.

11.5.1 *When you have received a License Key by phone or e-mail*



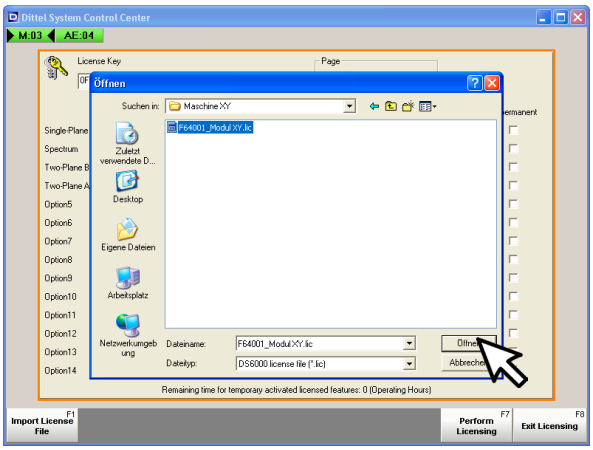
Click into the first screen and enter the complete License Key.
Highlight the licensed feature and the period of activation you have ordered.
Click on the [Perform Licensing] key or press the [Perform Licensing] softkey.



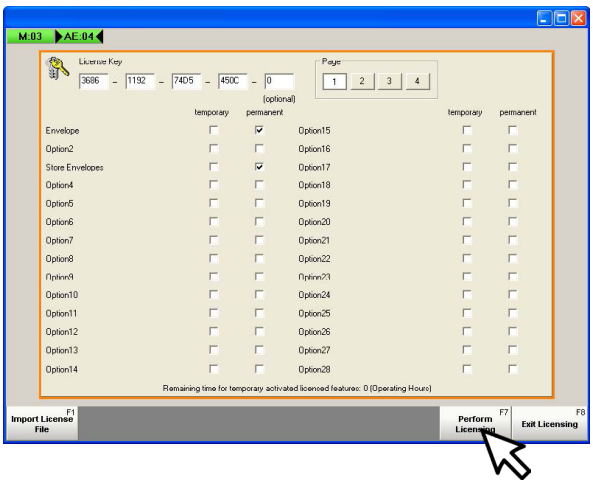
The message “The specified options were successfully activated” is shown.
Confirm the message.
Finally click or press the key [Exit Licensing].

11.5.2 *When you have received a License File by E-Mail*

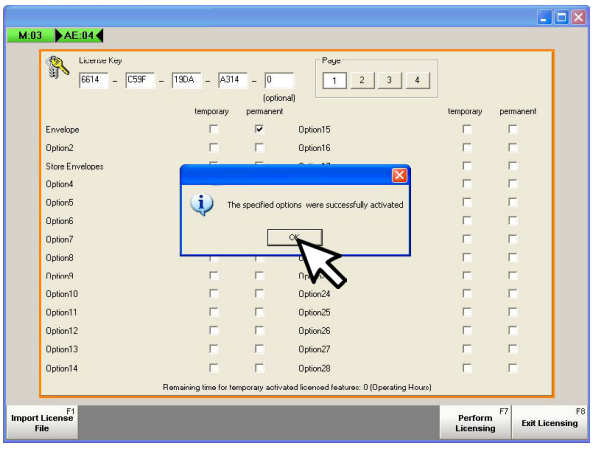
Save the License File (*.lic) under a suitable file name on a notebook or disk.
Click or press on key [Import License File], an additional screen opens.



Open the directory **Look** in and click on **Network Environment** (when using a notebook), the disk drive or the folder in which the License File (*.lic) is contained.
Highlight the *.lic-file and then click on **Open**.



The complete License Key and the feature(s) together with the period of activation you have ordered should be entered in the corresponding screens or boxes.
Click on the [Perform Licensing] key or press the [Perform Licensing] softkey.



The message “The specified options were successfully activated” is shown.
Confirm the message.
Finally click or press the key [Exit Licensing].

Appendice A – MHIS SOFTWARE - MARPOSS HUMAN INTERFACE SW

A.1 Integration of MARPOSS MHIS Software

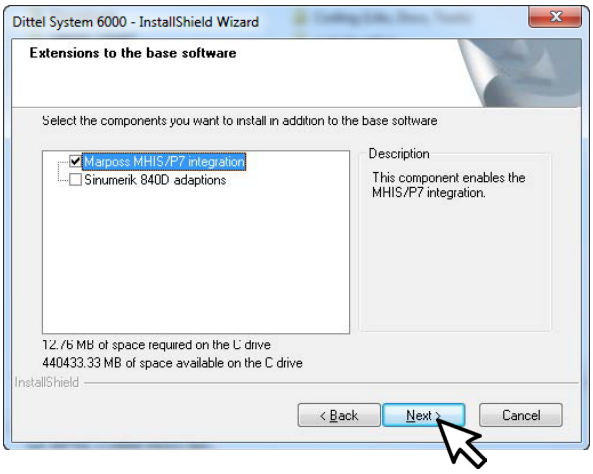
The purpose of the MHIS <-> DSCC integration is to have one single view for both software. This is realised by integrating the ActiveX control of the other application.
Starting from version 3.60 of the DSCC software, it is possible to integrate the MARPOSS software MHIS for the P7 in the DSCC software.

A.1.1 Requirement

The MARPOSS software MHIS (starting from 5.2G or 5.3C) must be installed on your Windows® computer or Automation System SINUMERIK©. However, the MARPOSS software can also be installed after the DSCC software.

A.1.2 DSCC Software Installation

During the DSCC installation process, there is an option to enable or disable the MHIS/P7 integration.

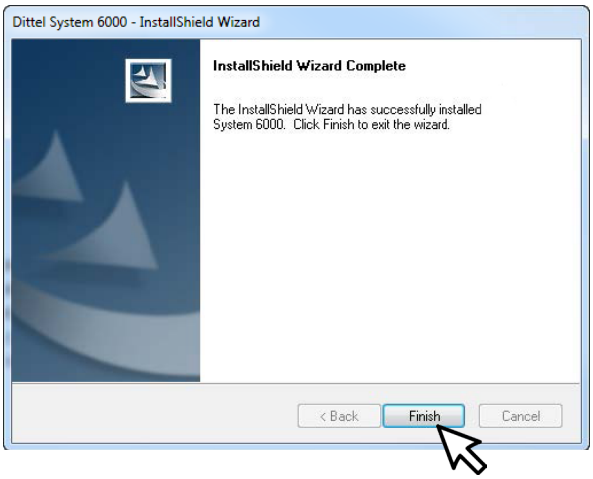


Additionally to the base software the following extensions may be installed:

- Marposs MHIS/P7 integration With this option the Marposs software MHIS is integrated and enabled.
- Sinumerik 840D adaptions

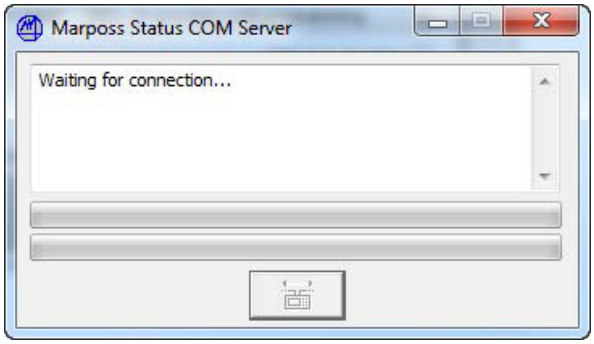
N.B.
Windows®-Installation:
The option **Sinumerik 840D adaptions** should **NOT** be selected when a standard Windows® installation is running.
SINUMERIK 840D Installation:
Make sure that the option **Sinumerik 840D adaptions** is selected!

Click on [Next >] to confirm the extension(s) and continue installation.

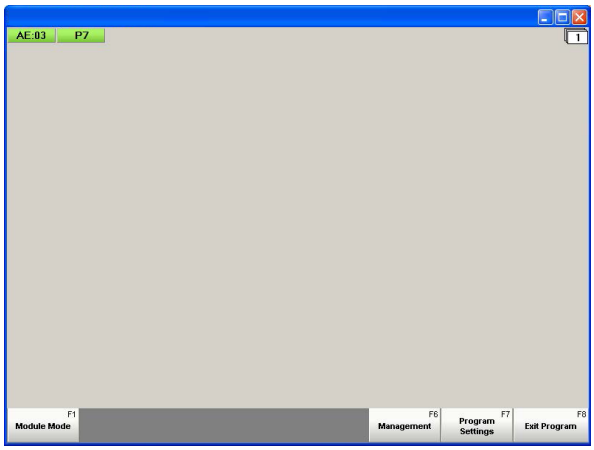


After successful installation the opposite screen is displayed:
Click on [Finish] to complete the installation of the DSCC Software together with Marposs MHIS/P7 integration.

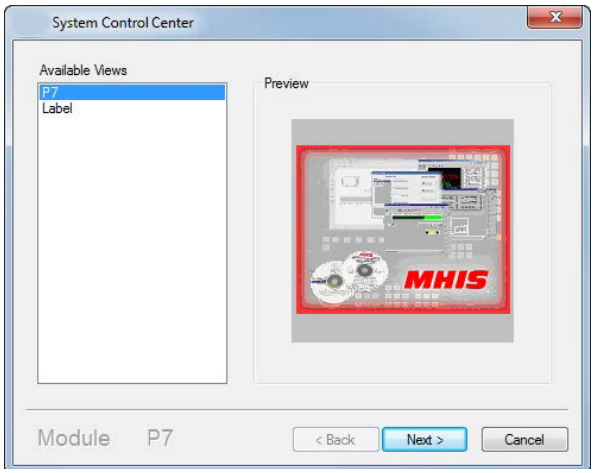
A.1.3 *Starting the Program*

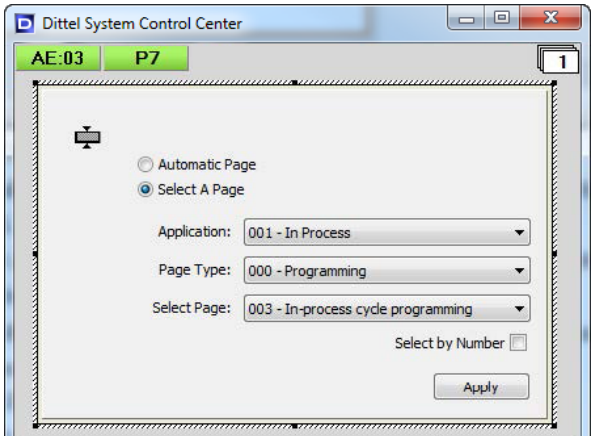


When the integration is enabled, on DSCC startup the “Marposs Status COM Server” dialog is shown and a green “P7” key is present on top of DSCC regardless of the connection between P7 and MHIS.



Double-clicking the P7 key opens a dialog where P7 views are listed that can be added to the DSCC user interface. Now a MHIS/P7 page can be selected.
It is possible to add multiple P7 widgets.





The opposite screenshot is the result of choosing the P7 view.
To continue refer to documentation regarding MARPOSS MHIS software and MARPOSS P7 hardware.

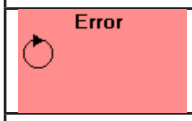
Appendice B – TROUBLESHOOTING GUIDE

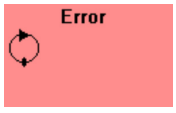
B.1 Hardware Troubleshooting

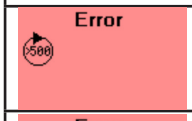
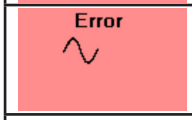
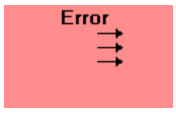
The following errors are only displayed on the screen when the **Balancing Standard** view is set; they may appear as single failure or in any combination.

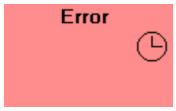
A System Control failure however is always indicated
• by a RED lighting System Control LED # 7
• and by a LOW signal at pin 2 of connector # 2, (additionally a LOW signal on pin 3, if Balancing Time is exceeded), or equivalent via PROFIBUS/PROFINET.

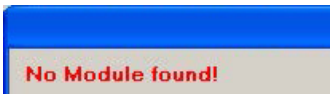
N.B.
When an **Error** message of the Proximity Switch, the Acceleration Sensor, or the Transmitting Unit appears, the M600x UP aborts itself the automatic Balancing Process (Auto Balancing Stop).
An **Error** message Balancing Time exceeded does **NOT** cause an automatic balancing abort, but this may be initiated by the machine CNC control if correspondingly wired and programmed.

Phenomenon	Malfunction	Solution
	No Proximity Switch signal: Spindle stands still	Check Proximity Switch, sensing distance, plugs, and cable. Error message disappears when spindle runs (> 300 rpm).

	Blinking vertical mark!
	If RPM Input is set to 1:1:
	speed ≤ 240 rpm,
	if RPM Input is set to 1:2:
	speed ≤ 120 rpm,
	if RPM Input is set to 1:4:
	speed < 72 rpm.
	
	Speed more than 30,000 rpm:
		Increase speed.
		
		Decrease speed

	Error message when activating the “Neutral Position Start” function: speed > 500 rpm.	Reduce speed or stop spindle. Wait until the wheel slow down, and then activate again the “Neutral Position Start”.
	No Acceleration Sensor signal:	Check Acceleration Sensor, plugs and cable.
	Short circuit in Transmitting Unit of the Balancing System:	Check Transmitting Unit, plugs and cable.
	Error message when the balancing cycle fails 5-times in a row and the unbalance is higher than the initial unbalance. M600x UP switches off (STOP).	Balancing System defective (for example, only one balancing weight is moving). Clear Error by restarting the Automatic Balancing Function.

Phenomenon	Malfunction	Solution
	The Error message “Balancing Time Exceeded” may have the following reasons:	
	• “Maximum Balancing Time” adjusted too short	Increase the max. Balancing time in the menu “Settings” → Tab “Current Settings” (standard 90 seconds).
	• Balancing capacity of the Balancing System too big or too small	The maximum balancing capacity depends usually on the biggest grinding wheel used. If even bigger or very small wheels are used the balancing capacity may not be sufficient, or overcompensation may occur.
	• Unbalance of grinding wheel inadmissible high	Pre-balance the grinding wheel.
	• Clamping of grinding wheel insufficient	Check clamping of the grinding wheel.
	• Modifications of motor drive, bearing, foundation	Unbalance Offset adjust must be carried out or repeated (refer to § 7.4).
	Reset of the “Balancing Time Exceeded” message is either made by * clicking or pressing the [Stop Auto Balancing] key and again clicking or pressing the [Start Auto Balancing] key, **or** * an external “Stop Balancing” signal (static from HIGH to LOW) followed by a “Balancing Start” signal (from LOW to HIGH) coming from the machine CNC control to pin 12 of connector # 2, or equivalent via PROFIBUS/PROFINET.	
No unbalance reading visible on the screen	Blanking of the unbalance reading by a static HIGH signal coming from the machine control.	Clear static HIGH signal at pin 19 of connector # 2 or equivalent at PROFIBUS® interface connector # 13.
Obviously wrong unbalance reading on the screen	Unbalance indication active during grinding, loading, feeding, etc.	During grinding, loading, feeding etc., apply a HIGH signal at pin 19 of connector # 2 or equivalent at PROFIBUS® interface connector # 13 to blank the unbalance reading.



No Module found!
Error message after starting the DSCC Program.
SOLUTION:
Check power supply of the module(s) (fuse).
Check connection to the Automation System or Computer (# 5).
Check settings of the COM-Port used.
After correction, the DSCC Program should recognize the connected module(s) automatically.

No Module found!
Please check the serial plug connection!
Error message after starting the DSCCProgram.
SOLUTION:
Check the power supply of the module(s) (fuse).
Check the serial interface cable from connector # 5 of the module to the computer or Automation System. Does the interface cable correspond to our specifications (see paragraph “Connector # 5 (only for M600x UP Modules with RS-232 Interface)”.

No Module found!
Please check the Baud Rate setting!
Error message short time after starting the DSCC Program.
SOLUTION:
The RS-232 Baud Rate of the module and the Automation System or Computer, which are connected together via RS-232, must be equal.

Respective Module does not answer:
Error message **AFTER** first recognition of the Module by the program.
SOLUTION:
Check power supply of the respective Module (fuse, lights LED # 4?).
Check connection to other Modules (Connector # 9 and # 10).
Check connection to Automation System or Computer (connector # 5).
After successful troubleshooting, the respective module address gets green again!
For Ethernet Interface, refer to Supplementary Document "Ethernet Interface".

The Module M600x UP is not operable via keyboard of the Automation System or PC; no module related softkey is available.

SOLUTION:
Clear static HIGH Signal on connector # 2, pin 14, or via PROFIBUS and PROFINET.
Check actual **Access Level**.

B.2 *Software Troubleshooting*

B.2.1 *General*

Message «New hardware found (serial mouse)»

When a DS6000 UP hardware is connected to the computer or automation system and you start your Windows® 7 / 10 the first time, the message «New hardware found (serial mouse)» appears.
CAUSE
Windows® recognizes the new hardware incorrect as a serial mouse.
SOLUTION
Open the file c:\boot.ini and add at the end of the start command the following option:
/NoSerialMouse:COMx (x = COM-Port used).

Message «Could not connect to the destination»

After a program start the message «Could not connect to the destination» appears.
CAUSE
Another device driver (e.g. mouse driver) or another application uses the selected serial interface.
SOLUTION
Select a free COM port or make sure that another device driver or another application does not use this COM port.

Windows® 7 / 10 Management of Rights

In principle, the installation of the software must be carried out with administrator rights (see paragraph "6.6 DSCC Software" on page 47).
Under Windows® 7 / 10 the software needs at least Power User rights. If the software, which runs under Windows® 7 / 10, shall also be used by a "normal" user, then the access rights must be changed as follows:
FILE PERMISSION
Permit "fully access" for the user or for all users ("Everyone") on the contents directory (default: C:\ProgramData\Dittel [Windows® 7 / 10].The software needs these rights to be able to access the databases and the configuration files.

B.2.2 *SINUMERIK®*

Pressing the softkey does not start the software, or when starting, an error message appears:

CAUSE
Various causes possible!
SOLUTION
Start the SINUMERIK® in the Service Mode (refer to paragraph “6.6.2.2 SINUMERIK® 840D” on page 51).
Check the installation path and the entries (path information) in file regie.ini (SINUMERIK® HMI Advanced) or systemconfiguration.ini (SINUMERIK Operate).
If the problem could not be solved in that way proceed as follows:
Create a safety copy of the file f:\user\oemframe.ini.
Open the file f:\user\oemframe.ini.
Delete the following sections:

```
[sccviewer]
hOEMFrameWnd=30456
hOEMFrameTask=04E4
hOEMAppWnd=304BC
hOEMAppTask=0
hOEMAppWndRelatedOEMAppTask=01F8
hOEMAppThread=0001
[scc]
hOEMFrameWnd=604C0
hOEMFrameTask=061C
hOEMAppWnd=304CA
hOEMAppTask=0
hOEMAppWndRelatedOEMAppTask=0698
hOEMAppThread=0001
```

If you still have problems with the operation or function despite the instructions mentioned above, please consult your local MARPOSS service centre for assistance (see paragraph “1.3 Requesting technical assistance and maintenance” on page 8).

Appendice C – CLEANING, MAINTENANCE, ENVIRONMENTAL PROTECTION

C.1 Cleaning

Clean the outside surface - primarily the blue front panel - as soon as spots, grease or dirt are visible. Using a clean, lint-free cloth lightly moistened with a solution of standard household washing-up liquid, remove all foreign matter from the case and front panel. Make sure, that no solution is dripping into the housing or remains in the proximity of plugs or gaps. Wipe dry using a clean, lint-free cloth.

N.B.
Certain chemicals and its vapours can damage the front panel and its lettering. Therefore, avoid the use of aggressive cleaning agents, solvents and other chemicals.

C.2 Maintenance

Since the inside of the M600x UP is largely insensitive against dirt and dust, the necessity for cleaning is only during repair. Isopropyl alcohol (75 Vol. %) is the only recommendable cleaning agent for printed circuit boards and the components. Apply the alcohol sparingly with a stiff, not metallic, short bristly brush. Wash the solved dirt to the edges. For quicker drying or removing dust from inaccessible areas a hand controlled dry air jet may be used. Take care to prevent damage by the air blast.

N.B.
The compressed air must be free of water, oil and other foreign matter and may not have any higher pressure than 15 psi/1 bar.
Use always fresh Isopropyl alcohol and a clean container to clean the printed circuit boards.

Appendice D – ABSTRACT PROFIBUS/PROFINET INTERFACE M600X UP

D.1 Data Format

N.B.
Project with “DS6000 UP 2 Byte In, 2 Byte Out” or “DS6000 UP 1 Word In, 1 Word Out”.

D.1.1 Automation System to Module M600x UP (Inputs)

Pos. Word.Bit	Pos. Byte.Bit	Function	Signal/Action
0.0	1.0	Balancing Start/Stop	Static Signal from 0 to 1: Balancing START Static Signal from 1 to 0: Balancing STOP
0.1	1.1	Neutral Position Start/Stop	Static Signal from 0 to 1: Neutral Position START Static Signal from 1 to 0: Neutral Position STOP
0.2	1.2	Keyboard Operation inhibit	Static 1: Operator keyboard actions on the PC or Automation System are disabled
0.3	1.3	Selects Set Number 1	see Truth Table E.1.3
0.4	1.4	Selects Set Number 2	see Truth Table E.1.3
0.5	1.5	Selects Set Number 3	see Truth Table E.1.3
0.6	1.6	Selects Set Number 4	see Truth Table E.1.3
0.7	1.7	Blanking of the Unbalance Reading	while Static 1: no Unbalance Reading, e.g. while grinding
0.8	0.0	Blanking of the Proximity Switch Error Reading	while Static 1: Blanking of the Proximity Switch Error Reading, e.g. at Spindle Stop
0.9	0.1	reserved	Static 0
0.10	0.2	reserved	Static 0
0.11	0.3	reserved	Static 0
0.12	0.4	reserved	Static 0
0.13	0.5	reserved	Static 0
0.14	0.6	reserved	Static 0
0.15	0.7	reserved	Static 0

Parallel Operation PROFIBUS/PROFINET with the Hardwire Interface, connector # 2
In principle, parallel operation of the PROFIBUS/PROFINET interface with the Hardwire interface is possible. In this case, the last change is executed, both on the Hardwire Interface and on PROFIBUS/PROFINET word 0.
Exceptions are the signals ‘Keyboard Operation inhibit’, “Blanking of the Unbalance Reading” and “Blanking of the Proximity Switch Error Reading” at which the static and the PROFIBUS/PROFINET signals are connected by logical OR.

D.1.2 *Module M600x UP (Outputs) to Automation System*

Pos. Word.Bit	Pos. Byte.Bit	Function	Signal/Action
0.0	1.0	Monitoring Status	While Balancing: 1
0.1	1.1	Monitoring System	System OK: 1
0.2	1.2	Monitoring Balancing Time	Balancing Time exceeded: 0
0.3	1.3	Monitoring Unbalance Limit 1	Below Unbalance Limit 1: 1 Above Unbalance Limit 1: 0
0.4	1.4	Monitoring Unbalance Limit 2	Below Unbalance Limit 2: 1 Above Unbalance Limit 2: 0
0.5	1.5	Monitoring Speed Limit 1	Speed below Speed Limit 1: 1 Speed above Speed Limit 1: 0
0.6	1.6	Monitoring Speed Limit 2	Speed below Speed Limit 2: 1 Speed above Speed Limit 2: 0
0.7	1.7	Monitoring Neutral Position	Neutral Position reached: 1
0.8	0.0	Monitoring Turn-off Threshold	Turn-off Threshold reached: 1
0.9	0.1	Neutral Position active	While weights are turning towards Neutral Position: 1
0.10	0.2	Pre-Balancing active	from Module Software Version 1.1, Build Number 0.50 Pre-Balancing active: 1
0.11	0.3	Confirms Set Number 1	rom Module Software Version 1.1, Build Number 0.50 see following Truth Table E.1.3
0.12	0.4	Confirms Set Number 2	from Module Software Version 1.1, Build Number 0.50 see following Truth Table E.1.3
0.13	0.5	Confirms Set Number 3	from Module Software Version 1.1, Build Number 0.50 see following Truth Table E.1.3
0.14	0.6	Confirms Set Number 4	from Module Software Version 1.1, Build Number 0.50 see following Truth Table E.1.3
0.15	0.7	Reserved	

D.1.3 *Truth Table to select or confirm the appropriate Memory Sets*

N.B.
During Automatic Balancing NO change of the Set Number is permitted. A change of the Set Number is not recognized by the unit or not possible!

Selects Set-No. / confirms Set-No	Binary coded Set-Numbers			
	4	**3**	**2**	**1**
No change	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

Appendice E – GLOSSARY – ABBREVIATIONS

E.1 Data Format

Access rights	Programs and other files are protected by a 5-level system of access restrictions: Five password levels for Service, Administrator, Expert, Operator and Observer.
Baud	Baud is a unit of computer etc. signalling speed. The speed in Baud is the number of discrete conditions or signal elements per second. If each signal event represents only one bit condition, then Baud is the same as bits per second. Baud does not equal bits per second.
CENELEC	Comité Européen de Normalisation Electrotechnique. CENELEC is the European committee for electrical standardization.
CNC	Computerized Numerical Control for machine tools (for example SINUMERIK®, Siemens AG).
ETHERNET	A local-area network (LAN) architecture developed by Xerox Corporation in cooperation with DEC and Intel in 1976. Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. The Ethernet specification served as the basis for the IEEE 802.3 standard, which specifies the physical and lower software layers. Ethernet uses the CSMA/CD access method to handle simultaneous demands. It is one of the most widely implemented LAN standards.
IP Address	An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255. For example, 138.57.7.27 could be an IP address.
PROFIBUS®	Process Field Bus is a fast, open field bus system widely used in automation technology. It is internationally standardised.
PROFINET®	PROFINET (Process Field Network) is the open industrial Ethernet standard for automation published by PROFIBUS & PROFINET International (PI). PROFINET uses TCP/IP and IT standards, is real-time Ethernet-compliant and allows the integration of field bus systems.
RS-232 Interface	Short for Recommended Standard-232C, a standard interface approved by the Electronic Industries Alliance (EIA) for connecting serial devices. In 1987, the EIA released a new version of the standard and changed the name to EIA-232-D. And in 1991, the EIA teamed up with Telecommunications Industry Association (TIA) and issued a new version of the standard called EIA/TIA-232-E. Many people, however, still refer to the standard as RS-232C, or just RS 232. The EIA-232 standard supports two types of connectors - a 25-pin D type connector (DB-25) and a 9-pin D-type connector (DB-9). The type of serial communications used by PCs requires only 9 pins so either type of connector will work equally well.
RS-422 Interface	Standard interface approved by the Electronic Industries Alliance (EIA) for connecting serial devices. The RS-422 standard is designed to replace the older RS-232 standard because it supports higher data rates and greater immunity to electrical interference. This standard is backward compatible so that RS-232 devices can connect to an RS 422 port.
SINUMERIK®	SINUMERIK® is a Computerized Numerical Control for Processing Machines, e.g. Machine Tools, made by Siemens AG.
Softkey	A key whose name appears on an area of the screen. The choice of softkeys displayed is adapted dynamically to the operating situation. Freely assignable function keys (softkeys) are assigned to functions defined in the software.
TCP/IP	Abbreviation of Transmission Control Protocol/Internet Protocol, and pronounced as separate letters. TCP is one of the main protocols in TCP/IP networks. Whereas the IP protocol deals only with packets, TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and also guarantees that packets will be delivered in the same order in which they were sent.
Termination	Electrical termination of a signal involves providing a terminator at the end of a wire or cable to prevent an RF signal from being reflected back from the end, causing interference. The terminator is placed at the end of a transmission line or daisy chain bus, designed to match impedance and hence minimize signal reflections.

E.2 *Abbreviations*

µm/s	Unbalance velocity
1/min	Speed, revolutions per minute
AE	Acoustic Emission
A/N	Article Number MARPOSS
AWG	Wire gauge (US)
BNC	Bayonet mount locking mechanism, RF coaxial connector
CAN	Controller Area Network
CAN-H	Data Line CAN
CAN-L	Data Line CAN
CNC	Computerized Numerical Control
CNTR-P	Data Line PROFIBUS
CSV	Short for comma-separated values, another name for the comma-delimited format of data representation
Ctrl	Control Key (keyboard)
CTS	Clear To Send (serial Interface)
DCD	Data Carrier Detected (serial Interface)
DGND	Digital Ground PROFIBUS
DIP	Dual In-Line Package
DSCC	Dittel System Control Center
DSR	Dataset Ready (serial Interface)
DTR	Data Terminal Ready (serial Interface)
EIA	Electronic Industries Association (US)
ESD	Electrostatic Discharge
g	Acceleration due to gravity, 9.80665 m/s²
GND	Ground
HMI	Human Machine Interface: SINUMERIK® operator functionality for operation, programming and simulation: HMI has the same meaning as MMC
LED	Light Emitting Diode
MHIS	MARPOSS Human Interface Software
MMC	Man Machine Communication: see HMI
nm	Displacement in Nanometre
OLE	Object Linking and Embedding
OPC	OLE for Process Control
PC	Personal computer
pC	Pico Coulomb, 10-12 Coulomb, SI unit of electric charge
PROX	Proximity Switch (Speed Sensor)
r/min RPM	Revolution per minute
RS-232	Standard of a serial Interface
RS-422	Standard of a serial Interface
RTS	Request To Send (serial Interface)
RxD	Receive Data (serial Interface)
RxD/TxD-N	Data Line PROFIBUS
RxD/TxD-P	Data Line PROFIBUS
SELV	Safety Extra Low Voltage, SELV circuits are isolated from the input voltage (line voltage) by double insulation or reinforced insulation. The voltage must not exceed 60 VDC (or 42.4 VAC)
TNC	Threaded version of a BNC connector, RF coaxial connector
TxD	Transmit Data (serial Interface)

U	Voltage
USB	Universal Serial Bus; serial bus system to connect peripheral equipment to the computer
Vdc	Voltage, direct current
VP	Supply voltage of the terminator (5 V), PROFIBUS
XML	Extensible Markup Language, is a W3C recommendation for creating special-purpose markup languages

MARPOSS

End of Installation, User and Programming Manual

M6000 UP / M6001 UP