MOVACOLOR

COLORING THE WORLD

MCSmart - 1.1.1.ENG.01
Database connection

MANUAL

Software revision : 1.1.1
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Index

1 Introduction

Thank you for purchasing a Movacolor metering device. This manual is addressed to operators and **qualified technicians** taking care of the metering of dry additives to ensure correct use of the Movacolor dosing unit.
ⓘ IMPORTANT NOTE: THIS MANUAL MUST BE READ BEFORE INSTALLING THE DOSING UNIT. KEEP THIS MANUAL IN A PLACE ACCESSIBLE FOR ALL OPERATORS.

1.1 **Symbols**

ⓘ Important note

 Attention; safety regulations for the operator

1.2 **Terms**

Operator:	A person charged to operate, adjust, maintain and clean the machine.
Qualified Technician:	A specialized, suitable trained person authorized to execute the installation, non-routine maintenance, or repairs requiring special knowledge of the machine and how it operates.

1.3 **Disclaimer**

Movacolor does not warrant that the hardware or software will work properly in all environments and applications, and makes no warranty and representation, either implied or expressed, with respect to the quality, performance, merchantability or fitness for a particular purpose.

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2 General information

2.1 **Safety**

The equipment is only designed and may only be used for the dosing of dry additives.
Any use that is not in conformity with the instructions is considered improper and as such frees the manufacturer from any liability regarding damage to things and/or persons.

Before switching on the unit for the first time, ensure that the mains power voltage applied is between 95 and 250VAC.

Always switch off the Movacolor control cabinet and disconnect the mains power plug from electrical power before performing maintenance.

Ensure that all parts are securely fixed to the extruder or injection molding machine.

Dangerous voltages are present inside the control cabinet for up to 2 minutes after it has been switched off.

2.2 **System requirements**

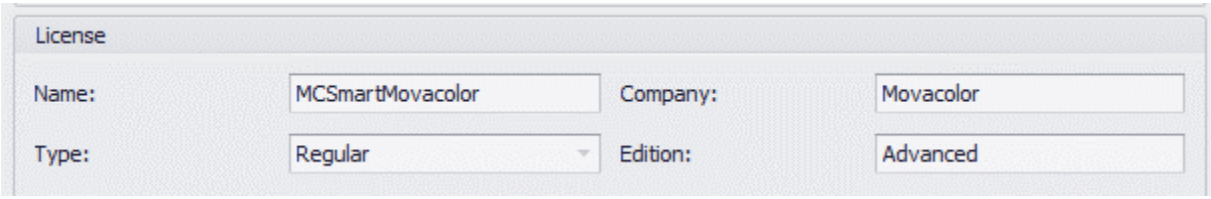
- Movacolor touchscreen controller software version 2.1.0 or higher;
- Personal computer with the following specification;
    - Windows 7, Windows 8, Windows 10 (x86 or x64);
    - Intel i5 processor or higher;
    - Gigabytes of RAM;
    - 10 gigabytes of free hard disc space*;
    - 10/100/1000Mbs Ethernet port;
- Touchscreen controllers and computers to be connected to the Network using cat 5 or higher network connection.

* maximum database size can exceed 10 gigabytes over time

3 MCSmart database connection

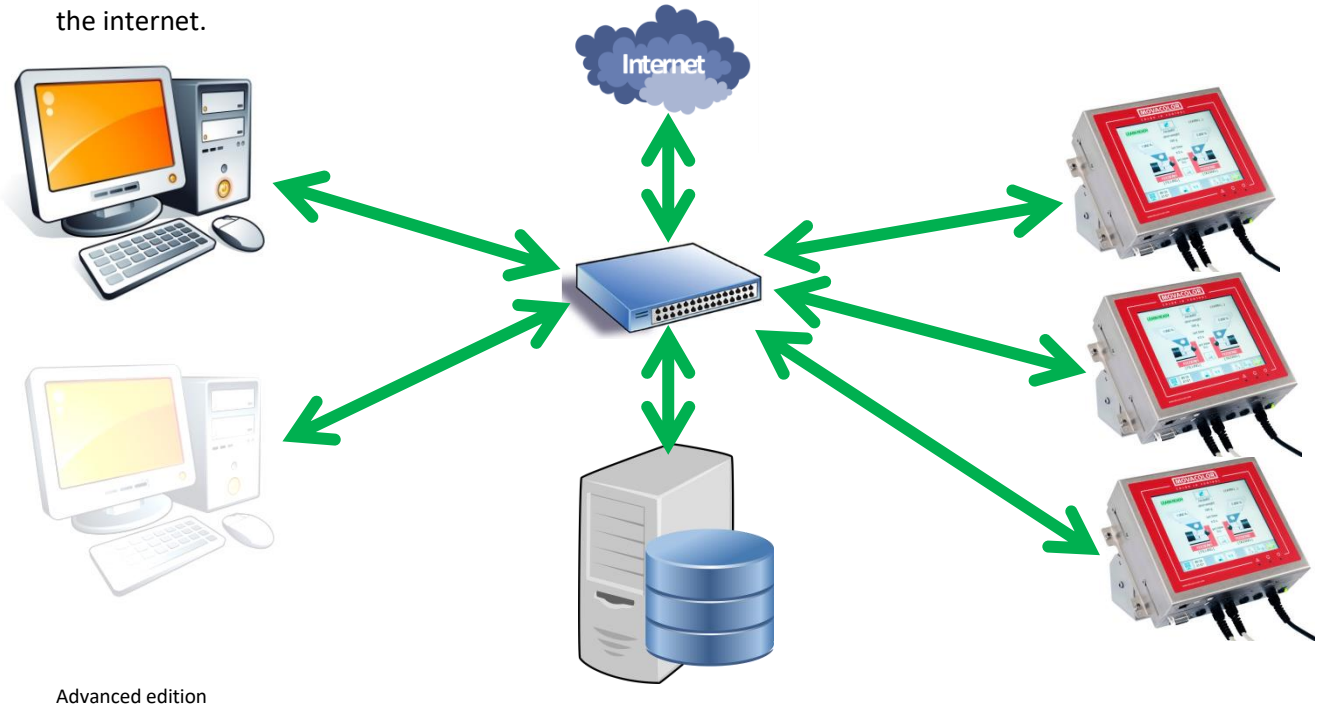
3.1 **Introduction**

To be able to read historic data generated by Movacolor dosing/metering equipment, MCSmart Advanced has to be used. Be sure you have the right license installed.



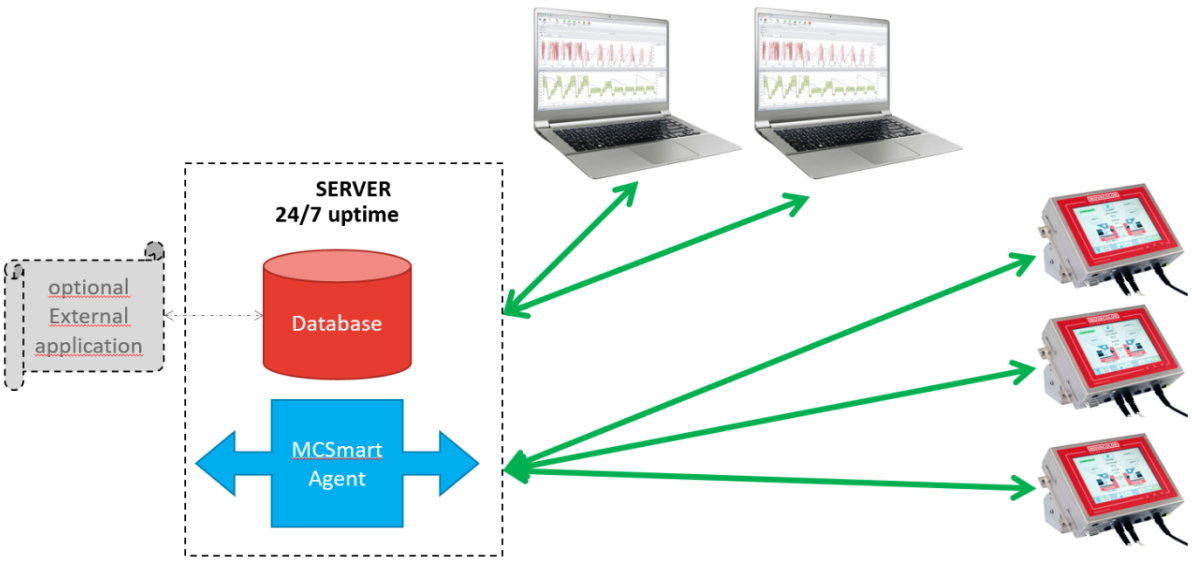
3.2 **MCSmart advanced Network System principle**

The most advanced installation option is the MCSmart advanced (server/client option). This version incorporates a dedicated database server (computer), single or multiple desktop or web clients and multiple MCTC's connected using a network which optionally is connected to the corporate network and/or the internet.



Advanced edition

3.3 **MCSmart system principle**



MCSmart uses a windows service (MCSmartAgent) which is collecting data from the MCTC's and puts this data into the database. This logging is time based:

- For extrusion based on a fixed time interval (by default each 30 seconds)
- For injection molding each shot

This data is put in different tables in the database, for table reference see chapter **5**

The MCSmartAgent service has to be active 24/7 to be able to collect all data from the MCTC's in the same network. This MCSmartAgent service can be installed on a separate computer or on the same computer the database server is running on.

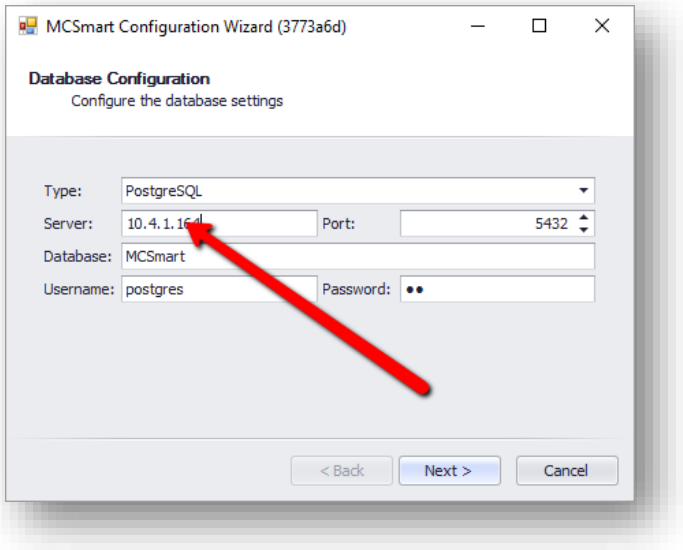
3.4 **Database types**

MCSmart advanced is designed to be able to use one of 2 types of SQL database servers

- PostgreSQL (free database software, supplied with MCSmart advanced)
- MSSQL

By default Movacolor is using PostgreSQL, however when the user already has a MSSQL server running, MCSmart advanced can connect to this MSSQL database server

During installation of the MCSmart server part (see MCSmart manual) the MCSmart agent is configured. One part of this configuration is selection of the type of database to be used. (database has to be active already!!)



Here you have used the passwords you have chosen during the installation of the PostgreSQL database or MSSQL database server configuration.

4 Database connection

To be able to connect your application to the MCSmart database you need the following connection information and credentials.

Database server type:	PostgreSQL or MSSQL
Database server IP:	IP address of the computer the database server is running on
Port number:	Portnumber where the database server is listening (PostgreSQL 5432, MSSQL 1433)
Database name:	MCSmart (default)
Username:	postgres
Password:	mc (Movacolor recommends to use “mc” as password)

!Connection methods differ for PostgreSQL and MSSQL.

5 Database table layout

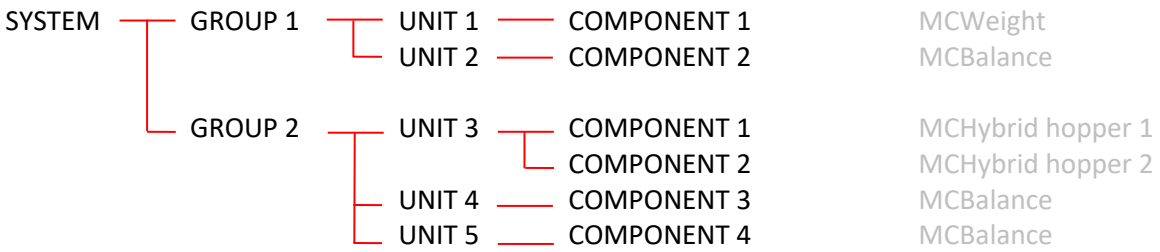
5.1 **MCTC data structure**

The MCSmart database table structure is a “mirror” of the MCTC used data model.

We define 4 different levels

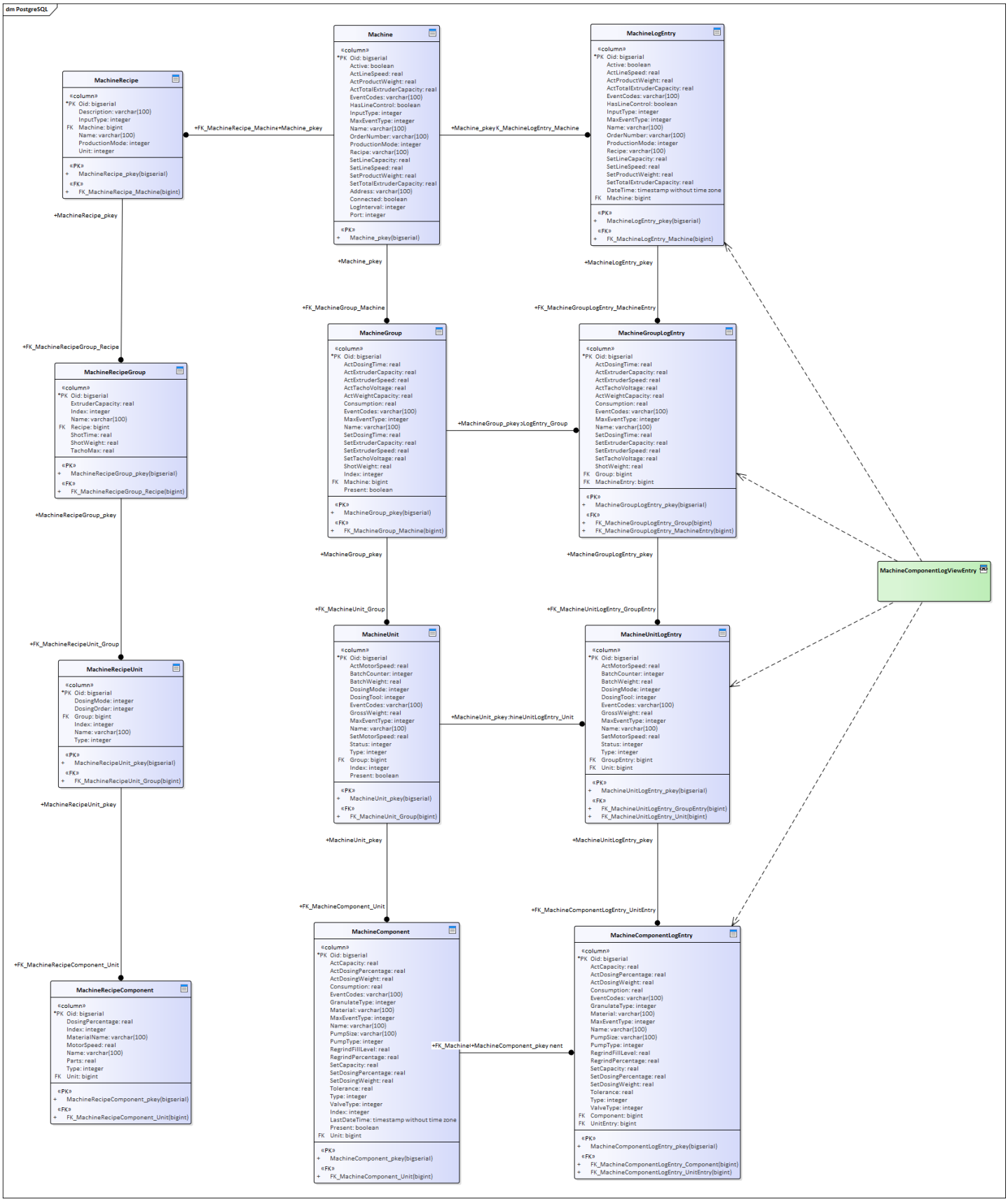
MCTC data model	SQL table	Max number of items
SYSTEM	Machine	1
GROUP	MachineGroup	1 up to 15
UNIT	MachineUnit	1 up to 15
COMPONENT	MachineComponent	1 up to 120

The MCTC configuration can be displayed as followed, example co-extrusion:



5.2 **Database table structure**

The figure below shows the database table structure:



5.3 **Table type definition**

1. Recipe related tables
2. Machine related tables
3. Machine log entry related tables
4. Machine Log view table

1 Recipe related tables.
Within these tables you can read recipe related information. It is not possible to write a new recipe and automatically synchronize to the MCTC.

2 Machine related tables
Within these tables you can read the last received information from the MCTC. Each time the MCTC sends new log information these tables are updated with the latest information.
The machine related tables do not contain any historic data.

3 Log entry related tables
These tables contain historic data. Each log entry has a unique number "Oid"

4 Log view table
The "MachineComponentLogviewEntry" table is a view to the 4 "MachineLogEntry tables".

For type 1 up to 3 we define 4 different levels of tables, according to the structure explained in the previous paragraph.

1. Machine level
2. Group level
3. Unit level
4. Component level

These tables have a relationship to each other by using a "Foreign Key"

Relationship between Machine and MachineGroup table by Machine Primary Key "Oid"
Relationship between MachineGroup and MachineUnit table by Foreign Key "Group"
Relationship between MachineUnit and MachineComponent table by Foreign Key "Unit"

5.4 **"MachineComponentLogviewEntry" table columns**

ColumnName	DataType	Level	Description
Oid	Bigint	Component	Row identifier
ActCapacity	Real	Component	Act capacity (g/s)
ActDosingPercentage	Real	Component	Act dosing percentage (%)
ActDosingTime	Real	Group	Actual dosing time (IMM, sec.)
ActDosingWeight	Real	Comoponent	Actual dosed weight (MCHybrid, gram)
ActExtruderCapacity	Real	Group	Actual extruder throughput (EXT, g/s)
ActLineSpeed	Real	Machine	Actual line speed (LineControl, m/min)
ActMotorSpeed	Real	Component	Actual speed of the dosing motor (rpm)
ActProductWeight	Real	Machine	Actual product weight (LineControl, g/m)
ActTachoVoltage	Real	Group	Actual supplied tacho voltage (EXT, V)
ActTotalExtruderCapacity	Real	Group	Actual extruder capacity (EXT, g/s)
ActWeightCapacity	Real	Group	Actual MCWeight measured throughput (EXT, g/s)
Batchcounter	Integer	Unit	Number of batches produced (MCHybrid)
Batchweight	Real	Unit	Batch weight of last batch (MCHybrid, g)
Component	Bigint	Component	Component identifier

Consumption	Real	Component	Component consumed material for this order (g)
DateTime	TimeStamp	Component	DateTime of logentry (utc)
DosingTool	Integer	Component	Type of dosing tool used (enum)
EventCodes	Character	Component	Active component events (event numbers)
GranulateType	Integer	Component	Normal of Micro granulate (enum)
GrossWeight	Real	Unit	Actual weight on scale (g)
GroupConsumption	Real	Group	Group consumed material for this order (g)
GroupEventCodes	Character	Group	Active group events (event numbers)
GroupMaxEventType	Integer	Group	Maximum event type (enum)
GroupName	Character	Group	Name of group
InputType	Integer	Machine	Start input type (enum)
MachineEventCodes	Character	Machine	Active machine events (event numbers)
MachineMaxEventType	Integer	Machine	Maximum event type (enum)
MachineName	Character	Machine	MCTC device name
Material	Character	Component	Used material name
MaxEventType	Character	Component	Maximum event type (enum)
Name	Character	Component	Component name
OrderNumber	Character	Machine	Used order number for consumption counters
ProductionMode	Integer	Machine	Producton mode IMM, EXT (enum)
PumpSize	Character	Unit	Unit pumpsize (MCLiquid)
PumpType	Integer	Unit	Unit pumptype (MCLiquid)
Recipe	Character	Machine	Used recipe name
RegrindFillLevel	Real	Component	RegrindFillStartLevel (MCTwin, g)
RegrindPercentage	Real	Component	Actual used regrind percentage (MCTwin, %)
SetCapacity	Real	Component	Set capacity (g/s)
SetDosingPercentage	Real	Component	Set dosing percentage (%)
SetDosingTime	Real	Group	Set dosing time, plastification time (IMM, s)
SetDosingWeight	Real	Component	Dosing weight setpoint (MCHybrid, g)
SetExtruderCapacity	Real	Group	Set extruder capacity (EXT, g/s)
SetExtruderSpeed	Real	Group	Set extruder screw speed (LineControl, rpm)
SetLineCapacity	Real	Machine	Set line total capacity (LineControl, g/s)
SetLineSpeed	Real	Machine	Set line product speed (LineControl, m/min)
SetMotorSpeed	Real	Unit	Set motor speed (rmp)
SetProductWeight	Real	Machine	Line product weight setpoint (LineControl, g/m)
SetTachoVoltage	Real	Group	Tacho ratio voltage setpoint (EXT, V)
SetTotalExtruderCapacity	Real	Machine	Set total line capacity (LineControl, g/s)
Shotweight	Real	Group	Set shotweight (IMM, g)
Tolerance	Real	Component	Used tolerance for alarming (%)
Type	Integer	Unit	Configured component sub type (enum)
UnitEventCodes	Character	Unit	Active unit events (event numbers)
UnitMaxEventType	Character	Unit	Maximum event type (enum)
UnitName	Character	Unit	Configured Unitname
UnitStatus	Integer	Unit	Unit production status (enum)
UnitType	Integer	Unit	Configured component type (enum)
ValveType	Integer	Component	Configured valve type (MCHybrid, enum)

6 Reading data from the table

All historic data can be retrieved from the MachineComponentLogViewEntry table.

Once the connection to the database have been made, data can be retrieved from the database by use of SQL queries.

A simple example query:

```
SELECT DISTINCT
  "OrderNumber"
FROM
  "MachineComponentLogViewEntry";
```

will output all order numbers which have been used

7 Document revision history

REV	DATE	DESCRIPTION
01	170824	Initial release