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| | Technical Specification MCPS 6.3 | CAD-Computer GmbH & Co. KG |
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Technical Specification MCPS 6.3

As a part of the
Quality management system for MCPS

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| Project name | MCPS- Monitoringsystem |
| Location | \\dserver1\NETDR\CAD-QMS\MCP63\Spezifikation\Release\Technical Specification MCPS63-E.doc |
| Associated documents | [1] MCPS System Prerequisits [2] |

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1. FUNCTION OVERVIEW MODULES AND OPTIONS

| | |
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| Basic package MCPS | - Import of Device data (DL, Darwin, LR, OR, VR) from floppy disc |
| | - Maximum number of devices in the device manager: 100 |
| | - Numerical (Solo window for digital announcement of a channel, text window for free choosable announcement of channels) announcement without channel limitation. |
| | - Graphical (Bar graph, X-Y-Trend window with maximum 5 Y-Axis, absolute/relative/relative hours scaling of the X-Axis, maximum 5 numbers of screens per trend window) announcement without channel limitation. |
| | - Export of data to MS Excel |
| | - Export of graphic to the clipboard or to an EMF/BMP-file. |
| | - Printing of graphic and text. |
| | - Cursor operations |
| | - Construction of print formulas / Layoutmanager |
| | - System of window layouts |
| | - Safety: The administrator can appoint as much detailed rights of access to users or user groups as he likes: Access ONLY on own projects / Access only on projects of his own group / Access on all projects. Additional it is possible to grant or refuse access on every point of menu to every user. |
| | - With corresponding device option are 20 project channels supported |
| | - Test generator Testdrv is implemented (Already available in the demo version.) |
| - MCPS-Configuration | |
| - Project - Configuration | |
| <u>Options:</u> | <u>Short description:</u> |
| C040 | - Channel extension up to 40 measurement channels / project |
| C120 | - Channel extension up to 120 measurement channels / project |
| C200 | - Channel extension up to 200 measurement channels / project |
| C500 | - Channel extension up to 500 measurement channels / project |
| CMX | - Channel extension up to unlimited number of measurement channels (Depending to memory ¹⁾) / project |
| MATH1 | - Mathematical basic functions like + - * / ^ |
| | - Statistics (Min-, Max.-values, Mean value, SD, MKT) |
| | - Mathematical channels |
| | - Bit test function |
| MATH2 | - Program variable SC, SR |
| | - MATH1 |
| | - Comparison functions / logical functions: AND, OR, XOR, NOT |
| | - Min-, Max value functions |
| | - Summarizing function (SUM) (Maximum 200 of different Accumulations per project) |
| | - Integrating function (IN) (Maximum 200 of different Intergations per project) |
| | - Moving average function. (SM) (Maximum 200 different buildings of moving averages per project.) |
| | - Stability function (SD) (Maximum number of SD-Register is unlimited.) |
| | - User functions |
| | - Polynomials |
| - Register | |
| MSERV | - Standard functions: SIN(X), COS(X), TAN(X), SQRT(x), EXP(x),... |
| | - Special functions: ITG, FRAC, MIN, MEAN, MAX, ID |
| MSERV | - Measurement-PC with MSERV -Option places Online data and alarm information at MCPS-Clients' disposal (For Example: NETVIEW) Establishing of connection up to 15 different measurement PCs with MSERV-option is possible. |
| REMOTE | - Remote operation for devices with RS 232/RS 422 interface over modem is supported. Processing of online data or memory download. (Requires ICMEM .) |
| ALARM | - 4 different software alarm level per channel, alarm delaying, alarm protocolling, Alarm actions: Relays circuits (See below "Overall view over supported Hardware"), user defined alarm messages. Dynamic alarm monitoring per reference file. Recognition of external device alarms from Yokogawa LR, μ R, VR, DX, Darwin. Sending alarms per SMS and/or E-Mail ²⁾ + ³⁾ |

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| <u>SMS-E</u> | - Dispatch of the administrator-, system- and device messages per E-Mail. Dispatch of alarm messages per SMS and/or E-Mail ²⁾ + ³⁾ |
| <u>ERES</u> | - Audittrail generated by the computer, password history, Protection of the measurement-, Log- and configuration files against change. Electronic record, electronic signature → 21 CFR 11 conform. |
| <u>ICMEM</u> | - Import of measurement data per Memory Card from HR, LR, µR - Import of measurement data per memory download over interface from the intern and/or extern memory of the measurement devices. |
| <u>SCRIPT</u> | - MCPS Scriptengine, Automation interface for the construction of customer defined reports, handing over of measurement data to MS Excel for example, device controlling, special data analysis, a.m.m.. |
| <u>BATCH</u> | - Display and administration of maximum 100 batches in a special control- and supervision window. (More than one simultaneous batch requires a corresponding MPE). - Display of all batches, which are saved in the data base in an explorer window. - Search- and filter functions in the data base - Signature (with ERES - option) |
| <u>PMON</u> | - Process monitor editor for visualization of process relevant data using bitmaps, AVIs, LEDs, analogue meters, digital values, bargraphs and multibitmaps. |
| <u>IR</u> | - Funcionality for visualization of infrared data. |

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| DEVICE OPTIONS (Necessary device driver to integrate the corresponding devices in MCPS-projects.) | Darwin | - Driver for DARWIN, DA/DC100, DR130/231/232/241/242 | |
| | HR | - Driver for HR 2300/2400/2500, HR 1300, DA 2500 | |
| | LR-OR | - Driver for LR 4100/8100/12000, ORM, ORP, OR 1400 | |
| | MODBUS | - Universal MODBUS-driver (MODBUS-RTU / MODBUS-TCP) | |
| | MXMW | - Driver for the MX 100 / MW 100 | |
| | DX/(P)-MV | - Driver for DX/MV 100, DX/MV 200, CX 1000/2000, DX 100P, DX 200P, DX 1000, DX 2000, 5180 V, 5100 E, 5100 V | |
| | S-Torq | - Senso Torq | |
| | OPC-C | - OPC client server | |
| | µR -VR | - Driver for VR 100/200, µR 1000/1800, µR 10000, µR20000 | |
| | DPM | - Driver for 2531, WT 110/130, WT 200/210/230, WT 1010/1030, WT 1030 M, WT 2010/2030, WT 1600 | |
| | MSC | - Driver for Controller, Sensormodule, Digital-Multimeter: A4011/17/18, A6015/17/18 A6050/51/60, ISM110, GSctrl, PersonalDAQ 55/56, PDQ1/2, PCI-DIO24H/48H/96H, PCI-PDISO 8/16, 4-channel-square-counter-card, PCIP8R8, PCI P16R16 | |
| | ALL | - Universal driver for devices with an ASCII-interface | |
| | 34970 A | - Driver for Agilent 34970 A | |
| | EBLOXX | - Driver for Gantner e.bloxx | |
| | IDL 100 | - Driver for Gantner IDL 100 | |
| | KE 2700 | - Driver for Keithley Integra Series KE 2700, KE 2701, KE 2750 | |
| | A 5000 | - Driver for Advantech A 5000 | |
| | IRCAM | - Driver for Pyroline / Pyroview, A20 / A40 infrared cameras | |
| | HLNT2 | - Driver for HLNT2 | |
| | DV2D | - Virtual Driver to display data as 2D-miscolor picture. | |
| | E5000 | - Driver for Eurotherm E5000-Series | |
| | PYM | - Driver for Infraret-Pyrometer (Metis-Series, CT-Series...) | |
| | XL | - Driver for XL 100 | |
| | WITS | - Driver for support of the WITS-Protocol | |
| | KE3700 | - Driver for Keithley 3700 - Series | |
| | WT3000 | - Driver for WT3000 Powermeter and WT500 Powermeter | |
| | W750 | - Driver for WAGO Series 750 | |
| | Multi-Project-Extension (MPE) (See BATCH too.) | MPE 5 | - Multi-Project-Extension up to 5 PARALLEL, asynchronous Projects |
| | | MPE 20 | - Multi-Project-Extension up to 20 PARALLEL, asynchronous Projects |
| | | MPE-MX | - Multi-Project-Extension up an unlimited number of PARALLEL, asynchronous projects. (Depending to memory. ¹⁾) |

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| NetView: | NV - 2 | - MCPS-NetView: MCPS up to 2 simultaneous Logins |
| | NV - 5 | - MCPS-NetView: MCPS up to 5 simultaneous Logins |
| | NV- 10 | - MCPS-NetView: MCPS up to 10 simultaneous Logins |
| | NV- 50 | - MCPS-NetView: MCPS up to 50 simultaneous Logins |
| MCPS-Network support. | NetView with network-dongle and dynamic licence management to visualize ONLINE-data and alarm information from the measurement-PC in the network. Add options MATH 1/2, SMS-E, ERES,SCRIPT, ICMEM once for the clients if necessary. To display online data and alarm information the MSERV -Option is on the measurement PC required | |

- ¹⁾ A more detailed information about the memory demand per channel or per project is unfortunately not possible because of the enormous number of possible configurations and measurement tasks.
- ²⁾ For the SMS-dispatch the SMS/E-option must be available. Dialing to the service provider (D1, Vodafone, etc.) is done by analogue modem or ISDN. For the alarming itself ALARM is required. The communication with the SMS - service-centre from the provider is realized using TAP or ERMES UCP protocol.
- ³⁾ For the dispatch of E-Mails and / or SMS the option SMS/E is required. The E-Mail dispatch is done over a SMTP server, which must be available in the network. For the alarming itself ALARM is required: SMTP-parameters for the dispatch of e-Mails are configurable.

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| Maximum sample rate | 0,1 Seconds |
| Maximum number of devices | 100 |
| Used numeral format | Float-numerals according to IEEE 754 with 32 Bit resolution |
| Maximum number of COM-ports | 36 |

2. SYSTEM CONDITION

Operating Systems

See document [MCPS System Prerequisites](#).

General Hardware Conditions

See document [MCPS System Prerequisites](#).

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3. OVERALL VIEW SUPPORTED HARDWARE

| | | | Setup-support | Data import / Gap - Filling | Output / Setting / Interface |
|--------------------------|------------------|---------------------------------|-----------------|--------------------------------|---------------------------------|
| Advantech | A 4000 Series | A 4011 / 17 / 18 | | | CS |
| | A 5000 Series | A 5000 | 1) | | |
| | | A 5013 / 17 / 18 / 50 / 51 / 80 | | | |
| A 6000 Series | A 6017 / 50 / 51 | | | | |
| Agilent | | 34970 A | | | CS |
| | | 34980 A | | | |
| Eurotherm | 5100 Series | 5100 E / 5100 V / 5180 V | | | |
| Gantner | | ISM 110 | | | CS |
| | | IDL 100 | | | DO |
| | e.bloxx | e.bloxx | | | DO, Relais, CS |
| IO Tech | Personal DAQ | Personal DAQ /55 / 56 | 5) | | |
| | PDQ | PDQ1 / PDQ2 Extension module | | | |
| Measurement Computing | PCI-DIO | PCI-DIO 24H/48H/96H | | | DO |
| | PCI-PDISO | PCI-PDISO 8/16 | | | DO, Relays |
| | PCI Quad | PCI Quad 04 | 5) | | |
| Yokogawa | DARWIN | DA 100 | 1), 6) | F, Int | DO, AO, Relays, S, B |
| | | DC 100 | 1), 6) | F, Int | AO, S, B |
| | | DR 130 / 231 / 232 / 241 / 242 | 1), 6) | F, Int | S, B |
| | MXMW | MX 100 | 1), 6) | ONL & OFF | DO, AO, S, B |
| | | MW 100 | 1), 6) | ONL & OFF | DO, AO, S, B |
| | DX(P)-MV | DX/MV 200 | 1), 6) | F, Int, Ext, OFF, ONL | S, B |
| | | DX 200 P | 1) | F, Int, Ext, OFF, ONL | S, B |
| | | DX / MV 100 | 1), 6) | F, Int, Ext, OFF, ONL | S, B |
| | | DX 100 P | 1) | F, Int, Ext, OFF, ONL | S, B |
| | | DX 1000 | 1), 6) | F, Int, Ext, OFF, ONL | S, B |
| | | DX 2000 | 1), 6) | F, Int, Ext, OFF, ONL | S, B |
| | | CX 1000 / 2000 | 1), 6) | F, Int, Ext, OFF, ONL | |
| | | | | | |
| | HR | HR 1300 | 2) b), 4) | M | CS |
| | | HR 2300 / 2400 | 2) b), 4) | M | CS |
| | | HR 2500 | 3) | | CS |
| | | DA 2500 | 3) | | CS |
| | LR-OR | LR 4100 | 3) | F, M | |
| | | LR 8100 | 3) | F, M | |
| | | LR 12000 | 3) | F, M | |
| | | OR 1400 | 3) | M | |
| | | ORM | 3) | M | |
| | | ORP | 3) | M | |
| | µR-VR | µR 1000 / 1800 | 2) b). 4), 6) * | M | S, B |
| | | VR 100 / 200 | 2) b), 6) | F | S, B |
| | | µR 10000, µR20000 | 3) | | |
| | DPM | 2531 | | | CS |
| WT 110 / 130 | | 2) a) | | CS | |
| WT 200 / 210 / 230 | | 2) a) | | CS | |
| WT 1010 / 1030 | | 3) | | CS | |
| WT 1030 M | | 3) | | CS | |
| WT 2010 / 2030 | | 3) | | CS | |
| WT 1600 | | 2) a) | | | |
| WT3000 | | 2) a) | | | |
| | WT 500 | 2) a) | | | |

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| Yokogawa | Controller | GSCtrl | | | |
| | Scopes | DL 708/716 | | F | |
| | XL | XL 100 | | | |
| ICP | | PCI - P8R8 | | | DO, Relays |
| | | PCI - P16R16 | | | DO, Relays |
| SensoPlan | | Senso Torq | | | |
| Keithley | Integra Series | KE 2700 / 2701 / 2750 | 5) | Int | DO, AO |
| | Supported Slotcards for Integra Series | - 7700 – 7703 - 7705 – 7708 - 7710 | | | Relay switching: 7705 DO, AO :7706 |
| | Morpheus-Series | KE 3706 | | | DO |
| | Supported Slotcards for Morpheus Series | - 3720 – 3723 - 3730 - 3740 | | | |
| Siemens | S - Serie | S5 über die OPC-C-Option | | | DO, AO |
| | | S7 über die OPC-C-Option | | | DO, AO |
| DIAS | PyroLine | PyroLine | | | |
| | PyroView | PyroView | | | |
| OPTRIS | CT-Series | CT Pyrometer | | | |
| SensorTherm | Metis-Series | Metis Pyrometer | | | |
| Flir | A-Series | A 20 | | | |
| | | A 40 | | | |
| | | A 320 | | | |
| | | A 325 | | | |
| | S-Series | SC 640 | | | |
| RoTronic | | HygroLogNT | | | |
| | | HygroFlex | | | |
| InfraTec | | VarioCam | | | |
| | | VarioScan | | | |
| | | VarioTherm | | | |
| Czaki | | TH3 | | | |
| Testo | | Testo645 | | | |
| TekScan | | TekScan | | | |
| WAGO | 750-Series | Field bus coupler | 750-312 750-314 750-315 750-341 750-342 750-841 750-842 750-872 | | |
| | | Analog-Input | 750-456 750-457 750-476 750-479 750-459 750-467 750-468 750-477 750-478 750-452 750-453 750-465 750-470 750-472 750-480 750-483 750-454 750-455 | | |

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| WAGO | 750-Series | Analog-Input | 750-466 750-473 750-474 750-492 750-469 | | | |
| | | Analog-Output | 750-550 750-552 750-553 750-554 750-555 750-556 750-557 750-559 | | | A'O |
| | | Digital-Input | 750-400 750-401 750-414 750-430 750-431 | | | |
| | | Digital-Output | 750-501 750-502 750-504 750-509 750-512 750-514 750-517 750-519 750-523 750-530 | | | DO |
| | | Power clamp | 750-493 | | | |
| | TOPASS | | | | | |

Legend:

| | |
|-----------|---|
| 1) | Complete setup support with setup sending, receiving and editing. |
| 2) | Partial setup support 1 with setup sending, receiving and partly editing. |
| a. | Type of channel and element. |
| b. | Type of channel, channel range, span, scale and unit. |
| 3) | Partial setup support 2 with setup sending and receiving. |
| 4) | Setup support over card reader. |
| 5) | Definition of device setup in the device driver. |
| 6) | Fixing of special setups to special devices. |

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| F: | Floppy, Data import from floppy disc. |
| M: | Memory card, data import from memory card. |
| Int: | Memory download over device interface from its internal device memory. |
| Ext: | Memory download over device interface from its external device memory. |

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| DO: | Digital output: Setting of digital outputs. |
| AO: | Analogue output: Setting of analogue outputs. |

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| S: | Set up Hardware – Alarms. In case of activating / changing an alarm in MCPS, MCPS will set up the alarm of the related device automatically. |
| B: | Confirm Hardware – Alarms. If in MCPS an alarm is acknowledged, automatically the corresponding hardware alarm is acknowledged too. |

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| CS: | Connection about COM – Server (Serial – Ethernet - coupler) is supported. |
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| ONL: | Online-Gap-Filling. MCPS fetches missing data out of the MX 100 / MW 100 FiFo at once the network connection is reestablished, unless there is still necessary data available in the FiFo memory of the MX 100 / MW 100 |
| OFF: | Offline-Gap-Filling. MCPS is able to import data from the CF-card of the MX 100 / MW 100 and put contingently missing data from this imported data into the original project where the data is missing. |

* = Setup fixing is not available for µR10000

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