MONITOR EMCOTRONIC

{version DC7.20. AC7.10, as of 14.4.92)

0, New with regard to DC version 07.10.
Parameter T6

1. General

1) Monitor data marked with "T" are valid only for T2 controls and are to be set to 0 in M2 controls. The same applies for data marked "M2".

2) Numerical values put in square brackets are recommendations for the setting of the respective monitor parameters on acceptance and should not be changed without previously contacting the Electronics Development Department. If different values are to be entered for different machine types these are to be seen in the enclosed "Table of the type specific setting parameters". If in the square brackets an * is indicated instead of a numerical value you have to enter a value in accordance with the special machine or its special equipment.

3) Valid numerical ranges, if any, for the respective parameters are indicated in parentheses.

4) For parameters divided into bits the following applies: The respective bit is to be set to 1 if the indicated control feature is to be activated, otherwise the bit must be set to 0.

5) Classification of the monitor parameters

D00-D49. general monitor data

F00-F49 axis setting parameter
G00-G49 tool turret

L00-L49 other peripheral devices
L00-L04 clamping device
L05-L09 tailstock
L10-L14 collecting tray
L20-L24 chip protection door
L25-L29 bar feed
L30-L31 central lubrification
L35-L39. M27 (divider)
L40-L49 other peripheral devices

M00-M49 main drive

M00-N49 numerical input limits

O00-O09 data interfaces (interface 0/1)
O10-O19 switch-on states
O20-O29 numerical input limits

O40-O49 general monitor data

R00-R49 machine specific position data

S00-S49...setting parameters for cycles

T00-T19...axis controller
T20-T29...graphics and monitor display
T30-T39... interface controller
T40-T49...software options, optional G/M codes

X00-X49 numerical input limits
X00-Z49 not used

2. User monitor (MON)

Valid parameters:	D	G	L	M	O	S	T
	00	08	02	08	00	00	22
	01		11		01	01	24
	02		25		02	02	26
	03		39		03		
	05				11		
	06				12		
					22		
					40		
					45		

D00...Baud rate for serial interface (150- 4800} <300>

D01...priority of the door limit switch <1>
D1=1: The door limit switch is not effective in MANUAL and REFERENCE
D1=3: In addition to priority 1 operation with door open is possible in AUTO/DRYRUN but switching on the main drive is impossible.
D1=7: In addition to priority 3 operation with door open in AUTO/DRYRUN, AUTO/SINGLE and in EXECUTE mode is also possible with main drive.
D1=8: Procedure equal to D1=7, the coolant, however is switched off when opening the door during active CYCLE START.
For all values of D1 not indicated here the door limit switch is generally effective (top priority) .
Note :Mind dependence of the effect of the door limit switch on the hardware state of the AC (as from software Vn.2.0 and new AC) : The priorities 3, 7 as well as switching on the main drive with door open and priority 1 work correctly only if the respective hardware change on the AC has been executed and T10/bit0 has been set.

D02...desired workpiece number with workpiece presetting <1>

D03...actual value of workpiece counter <0>

D05...step width of the block number setting with contour scanning.
D06...Tolerance dimension for automatic rounding of two contour elements during contour scanning.
It can be set between 0 and 255 but the transition with 0 must be exactly tangential so that it is not rounded. If a value larger than in T07 is set, the one set in T07 is used as actual value.

G08...MSD-bits

bit 0...modified tool turret approach. <0>
a) swivel in of next position with RESET
b) swivel in manual mode also without JOG ENABLE
bit 1...M2-tool turret, swiveling procedure:
feed override = 100 %, switch not effective. <0>
Note: with type 130 tool turret this bit must be set in delivery state so that the feed override switch during the swiveling procedure is not considered!

L02...MSD-bits 16 → 6
bit 0...Activation of final position control for automatic pneumatic clamping device <1>
bit 1...Activation of MC90 vacuum pump <0>

L11...MSD-bits
bit 0...Collecting tray ET240: Stopping program <0> 57 → 0
a) with M24 until 'collecting tray advanced' is active
b) with M23 until 'collecting tray swiveled out" is active
L25...MSD-bits
bit 0...ignore bar end signal <0> 40 → 0
bit 1...selection bar feed <*>
bit 2...selection bar loading <*>
L39...MSD-bits
bit O...activation of M27 (divider) <*> 0
bit 1...activation of M65 <*>

M08...spindle position for M19, unless an S word has been programmed <0>

O00...MSD-bits 128 → 1
bit 0...Display of the data read in via the serial interface on display and monitor, moreover, during reading in workpiece programs there is no control if the read-in workpiece program already exists In the memory, thus an existing workpiece program in the memory can be edited via the interface. <0>
bit 1...During reading out via the serial interface 50 ASCII characters 'NUL' each at the start as well as at the end are edited (punched tape feed/endpiece) .
bit 2...During printing a CRLF as line end is transmitted via the parallel interface on the GC

001...Defining the data format for the serial interface <1> 176

bit 0. ..ISO data format .(bit 0 = 0: Ernco format for MSD-print-out formatted one below the other)

bit 1 ...Where reading out a workpiece program the character transmitted last is a 'control Z' (IAH or 26 decimal)

bit 2-7: Configuration of the serial interface; in case that all bits are set to 0 the configuration of the software versions supplied up to now is set as default value:

bit 2/3: number of data bits: 0/1 7 bits
1/1 8 bits

bit 4...Parity enable

bit 5...Even parity

bit 6/7: Number of stop bits: 0/0 invalid
1/0 1bit
0/1 1.5 bits
1/1 2 bits

002...Limitation of editing tool data on cassette/RS232: Here the largest index to be stored is to be entered (<100) <99>

003...MSD-bits for the interface operation

bit 0.. ..INPUT ALL: the programs existing in the memory are overwritten without inquiry (no message 'ALREADY EXISTS')

bit 1.. ..OUTPUT ALL: existing programs on the data carrier (cassette) are overwritten ~; without inquiry (no message I ALREADAY EXISTS')

011...MSD-bits 32

bit 0...diameter programming (T2) <1>
bit 1...switch-on state G70 <*>
bit 2...collet with automatic clamping device <*>
bit 3. ..Switch-on state = M51 with tool turret with direction logic <*>
bit 4...door automatic: switch-on state M53 <0>

012...Switch-on state G code group 9, axis switch-over (17 - 22) .Invalid values cause the largest valid code of this group to be selected. (M2) <*>

022...Smallest valid O-number for subprograms (0- 255) <80>

040...MSD-bits 4 9

bit 0...Ignore the software limit switches in manual mode. The bit is automatically deleted when actuating the next RESET (exception: in T/PSO mode or in the monitor) .<0>
bit 1. ..Tool measuring with reference workpiece
(manual mode, T2)
bit 2...Lock memory <0>
bit 3...Lock control <0bit 4...Activate workpiece counter <1>
bit 5...Mode "workpiece presetting" <0>
bit 6...Alarm 570 with G41/42 is not emitted if it is caused by possible contour inaccuracies.
bit 7...Selection FMS-mode <0>

045...Activation of the laser adjusting operation. If this parameter is set to 255 it is possible to open the shutter with open door and shut safety key switch. In case of change of modes or reset this parameter is automatically reset to 0.

S00...Minimum feed during G85/87/88 (T2) or G83/86 (M2) in ...<100>

S01...Number of finishing cuts during G85 <0> (T2)

S02...Return during G86 (T2 and M2) and G87 (T2) <500>

T22...planned: setting of language version <0>
O...second language

T24...MSD-bits <*>
bit 0. ..suppression of sketch display (graphics)
bit 1...display of rotating edges (graphics, turning)

T26...Default angle of view for 3D-representation (0-95)
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3. Protected monitor (MONITOR)

Valid parameters. D, F, G, I, L, M, N, O, R, S, T, X

On account of completeness the parameters also accessible via the user monitor are also listed here to receive a complete version of all available MSD.
Parameter I is not edited or read in with the other machine data, it is only used internally (I0 for the elapsed time indicator).

D00...Baud rate for serial interface (150- 2400) <300>

D01...Priority of the door limit switch <1>
D1=1: The door limit switch is not effective in MANUAL and REFERENCE
D1=3: In addition to priority 1 operation with door open is possible in AUTO/DRYRUN but switching on the main drive is impossible.
D1=7: In addition to priority 3 operation with door open in AUTO/DRYRUN, AUTO/SINGLE and in EXECUTE modes is also possible with main drive.
D1=8: Procedure equal to DI=7, the coolant, however, is switched off when opening the door during active CYCLE START.

For all values of D1 not indicated here the door limit switch is generally effective (top priority) .
Note: Mind dependence of the effect of the door limit switch on the hardware state of the AC (as from software Vn.2.0 and new AC) : The priorities 3, 7 as well as switching on the main drive with door open and priority 1 work correctly only if the respective hardware change on the AC has been executed and G7/bit0 has been set.

D02...Desired workpiece number with workpiece presetting <1>

D03...Actual value of workpiece counter <0>

D04...Number of 1k RAM blocks existing on DC <64>
(Note: Approx. in the beginning of 1989 a modified printed circuit version of the data controller will be produced in series which will be assembled with 32k RAM modules. A memory extension up to 64k or later on up to 128k will be possible then.)

D05...Step width of block number setting with contour scanning.

D06...Tolerance dimension for automatic rounding of two contour elements during contour scanning. It can be set between *O* and 255 but the transition at 0 must be exactly tangential so that it is not rounded. If a larger value than in T07 is set the one set in T07 is used as actual value.

D10...Timeout or automatic laser run-up in 1/10s <150>

D11...Delay time for automatic laser run-up in1/10s. <30>

D12...Initialization values for basic frequency and pulse width after switch-on. <2610>
D12 = 256 * basic frequency + pulse width basic frequency [1- 16] ?corresponds to 100Hz
160Hz pulse width [0-100] corresponds to 0% -100%

D13...Minimum output with mode output adjustment in [W] . <35>

D14...Minimum pulse width with mode output adjustment [0- 100%] .<65>

F00...Numerical input limit for parameter F, at the same time maximum programmable thread pitch.

F01...Maximum traversed feed per minute in mm/min (automatic and execute modes) <see table>

F02...Maximum traversed rotary feed in um/r (automatic and execute modes) <see table>

F03...Feed limit for manual mode in mm/min <see table>

F04...Safety feed in manual mode in mm/min <300>

F05...Dryrun feed in mm/min <see table>

F06...Express motion feed X axis in mm/min <see table>

F07...Express motion feed Y axis in mm/min <see table>

F08...Express motion feed Z axis in mm/min <see table>

F09...Feed for approaching reference point limit switches <see table>

F10...VMC200-tool turret: feed during moving up into swiveling position <5000>

F20...X axis: steps/feed spindle rotation <see table>

F21...Y axis: steps/feed spindle rotation <see table>

F22...Z axis: steps/feed spindle rotation <see table>

F23...Axis acceleration <see table>

F24...feed resolution in steps /mm <see table>

G00...tool turret type <*>

<0>...no tool turret
<1>...type 0: tool turret simulating operation for heating chamber
<2>...type 1: SAUTER tool turret without direction logic
<4>...type 2: SAUTER tool" turret with direction logic
<8>...type 3: EMCO tool turret (valid for R3 and A7)
<16>...type 4: hydraulic SAUTER 4-station tool turret
<32>...type 5: DUPLOMATIC BRV 150
<64>...type 6: DUPLOMATIC BSVN 160 with direction logic
<130>...type 130: M2-TOOL TURRET FOR VMC100 with direction logic
<131>...type 131: tool turret for MC90

G01...tool turret: time function element 1 <*>
Type 0: switch-on time of both tool turret motor exits <10>
Type 1,2: <0>
Type 3: time from recognizing the new tool turret position until directional reverse <with R3-tool turret 4, with A7-tool turret 1>
Type 4: time from recognizing the new tool turret position until change of output signals <2>
Type 5: time from recognizing the new tool turret position until directional reverse <with new motor driver board 1, otherwise 0>
Type 6: delay from response of 'control locking device' until switching off the motor during locking (in units of 800us) .<approx. 70>
Type 130: number of tool turret positions <10 for VMC 100 and 12 for VMC200>

G02...tool turret: time function element 2 <*>
Type 0,2: <0>
Type 1,5: time from switching on the brake until switching off the motor and pre-indexing <1>
Type 3: time of directional reverse of rotation until switching over to pulse/chamfer cutting operation <with R3-tool turret 7, with A7-tool turret 4>
Type 4: time from change of output signals until terminating the swiveling procedure <7>
Type 6: time from response of control locking device until switching off pre-indexing <2>
Type 130: number of main spindle rotations per tool turret division <2>

G03...tool turret <*>
Type 3: R3-tool turret <0>
A7-tool turret: bit 7 is the identification of the direct-current tool turret, bit 0 up to 6 define the switch-on time per cycle of the reverse swiveling signal in units of 800us <130>
Type 5: chattering of position messages: number of necessary scans with equal result <40>
Type 130: positioning speed of main drive during swiveling see table at the end.

G04...tool turret <*>
Type 3: R3-tool turret: <0>
A7-tool turret: switch-off time per cycle of reverse swiveling signal in units of 800us <3>
Type130: main spindle position with valid magazine position <*> otherwise <0>

G05...setting bits for VMC200. tool turret
bit 0:...identification bit for VMC200, functions as follow: a) output of delay set under G06 also in case of positioning main spindle prior to Z traversing movements during tool change
b) control of extended sync impulse during Z traversing movements of tool change (only below the position set in R13)
bit 1...not assigned <0>
bit 2...not assigned <0>
bit 3. .not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

G06...M2-tool turret type 130: time delay after swiveling the magazine until moving down the Z slide (in 1/10s) values see table at the end.
Note: This time function element is also emitted when synchronizing the tool magazine onto position 1 in MANUAL mode when reaching the next position.

G07...M2-tool turret type 130: period within which the next position must be reached during swiveling the magazine (in 1/10s, is limited internally to 1.5s) <15>

G08...MSD-bits
bit 0. ..modified tool turret control: <0>
a) swiveling of next position during RESET
b) swiveling also without JOG ENABLE in manual mode
bit 1. ..M2-tool turret, swiveling procedure: feed override = 100 %, switch ineffective. <0>
Note: with type 130 tool turret this bit must be set in delivery state so that the feed override switch is not considered during the swiveling procedure!

G09...indexing time of tool turret in units of 100ms (for machining time measurement in graphics operation)

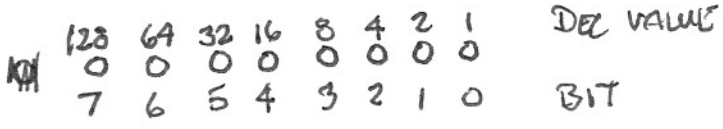
G10... swiveling time between two positions in units of 100ms (for machining time measurement in graphics operation)

I00...current value of operation time counter, is not output/read in with the other MSD

I01 –149…not used

L00...automatic clamping device type 'front end chuck':
switch-off delay during clamping procedure from response of the push-switch until switching off the pressure line (in 1/10s) <20>

L01...MSD-bits for automatic pneumatic clamping device (T2) <*>
bit 0-5: with hydraulic clamping cylinder time limit for response of respective push-switch in 1/10s (0-63). With front end chuck (bit 6=1) : period within which the pressure must be built up and reduced again upon actuation of the chuck.
bit 6... front end chuck
bit 7...activation of an automatic pneumatic clamping device <L01 = 191 with hydr./pneumat./with bore/full clamping cylinders, L01 = 255 with front end chuck and clamping cylinder with bore ET 220>



L02...MSD-bits
bit 0. ..activation of final position control for automatic pneumatic clamping device <1>
bit 1... activation of vacuum pump for MC90 clamping table

L03...MSD-bits
bit 0...alarm 900 is not emitted if the main drive is switched on with open clamping device.<O>

L05...MSD-bits
bit 0...activation of an automatic tailstock sleeve <*>
bit 1. ..tailstock logic is used for triggering an additional clamping device. <0>

L10...MSD-bits
bit 0. ..not assigned
bit 1. ..activation of workpiece collecting device <*>
bit 2...triggering flap ET 90 <*>

L11...MSD-bits
bit 0. ..collecting tray ET240: stopping the program <0>
a) with M24 until 'collecting tray advanced' is active
b) with M23 until 'collecting tray swiveled out' is active

L20...MSD-bits <*>
bit 0...activation of automatic chip guard door
bit 1...activation of oil mist separator

L25...MSD-bits
bit 0...ignore bar end signal <0>
bit 1...selection bar feed <*>
bit 2...selection KUPA bar loading magazine <*>
bit 3...selection MINITURBO bar loading magazine <*>

L26...MSD-bits
bit 0...activation bar feed <*>
bit 1...activation bar loading magazine <*>

L30...MSD-bits for lubricatlon system < >
bit 0- 6: traversing path in units of 400000 AC steps after which a lubrication impulse is emitted with automatic central lubrication and the lubricant LED is switched on in case of manual lubrication <20m>. The traversing path corresponding to the 400000 AC steps is defined by means of the feed resolution
(monitor data F24, number of AC steps per mm) .
bit 7...activation of an automatic central lubrication system

L31...MSD-bits
bits0 -.7: duration of emitted lubrication impulse in 1/10s. <see table>

L35...length of the impulse in 1/10s emitted with M27 <3>

L36...duration of timeout control with M27 <100>

L37...duration of timeout control with M65 in 1/10x <255>

L38...duration of timeout control with M65 in units of 25.6s <0>

L39...MSD-bits
bit 0...selection of M27 in user monitor <*>
bit 1...selection of M65 in user monitor <*>

L40...MSD-bits <*>
1 bit O...activation of MI07 (X16a/pin21) : thermocontrol switch cabinet
bit 1...activation of MI18 (X16c/pin8) : CS externally
bit 2...activation of MI16/17 (X16c/pin 10/9) : clamping device open/close
bit 3...activation of MI15 (X16c/pin11) : hardware error bar feed
bit 4...activation of FMS software
bit 5...activation of MI20/21(X16:6/5) : tailstock sleeve left/right
bit 6...activation of MI26(X16b:18) : thermocontrol hydraulics
bit 7...activation of MI27 (X16b:17) : thermocontrol chip conveyor.

L41...MSD-bits <*>
bit 0...key switch memory block

L42...duration of timeout control until laser source is ready in 1/10s <10>

L43...delay time from releasing the shutter operation until control of the respective shutter position proximity switch in 1/10s.

L44...delay time from switching on the process gas until control of process gas pressure switch in 1/10s.

L45...MSD-bits
bit 0...activation chip conveyor <*>

L46...chip conveyor running time in s <*>
.
L47...chip conveyor dead time in s <*>

M00...main spindle acceleration <see table>

M01...calibrating factor main motor current indication <see table>

M02...calibrating factor main motor speed indication <see table>

M03...main spindle resolution in impulses/rev. <see table>

M04...upper speed limit main drive (switch-on state) <see table>
With active wood-working center high speed level (displayed speed with M43)
.
M05...minimum speed limit main drive <see table>
Low speed level with active wood-working center (displayed speed with M42) .
M06...positioning speed for M19 <50>

M07...upper speed limit main drive for slow gear step <*>

M08...spindle position for M19, unless an S-word has been programmed <0>

M09...minimum speed limit for slow gear step

N00...numerical input limit for parameter O <6966>

N01...numerical input limit for parameter D <32767>

N02...numerical input limit for parameter N <9999>

N03...numerical input limit for parameter T <9999>

N04...numerical input limit for parameter L <25599>

N05...numerical input limit for S in rpm <see table>

N06...numerical limit for T word <see table>

O00...MSD-bits
bit 0...display of the data read in via the serial interface on display and monitor, moreover, there is no control during read-in of workpiece programs as to whether the workpiece program read in already exists in the memory, thus a workpiece program existing in the memory can be edited via the interface. <0>
bit l...during reading out via the serial interface 50 ASCII characters 'NUL' each at the start and at the end are edited (punched tape feed/endpiece) .
bit 2...during print-out a CRLF as line end is transmitted via the parallel interface on the GC.

O01...Defining the data format for the serial interface <1>
bit 0...ISO data format (bit 0 = 0: Emco format for MSD-print-out formatted one below the other)
bit 1...when reading out a workpiece program the character transmitted last is a 'control Z' (1AH. or 26 decimal)
bit 2-7: configuration of the serial interface; in case all bits are set to 0 the configuration of the software versions supplied up to now is set as default value:
1 start bit, 7 data bits, 1 stop bit, even parity
bit 2/3: number of data bits: 0/1 7 bits
1/1 8 bits
bit 4... parity enable
bit 5.. .even parity
bit 6/7: number of stop bits:
0/0. invalid
1/0 1 bit
0/1 1.5 bits
1/1 2 bits

O02...Limitation of editing tool data on cassette / RS232:
Here the maximum index to be stored is to be entered (<100) <99>

O03...MSD-bits for interface operation
bit 0.... INPUT ALL: the programs existing in the memory are overwritten without inquiry (no message 'ALREADY EXISTS') if the program numbers correspond to an entered and existing program
bit 1.... OUTPUT ALL: programs existing on the data carrier (cassette) are overwritten without inquiry (no message' ALREADAY EXISTS') if existing programs have the same numbers as the programs to be read out.

O10...switch-over between turning and milling machine control
010 = 0.... lathe (T2)
010 = 255...milling machine (M2)

O11...MSD-bits
bit 0...diameter programming (T2) <1>
bit 1...switch-on state G70 <*>
bit 2...collet with automatic clamping device <*>
bit 3...switch-on state = M51 with tool turret with direction logic <*>
bit 4...door automatic: switch-on state M53 <0>

O12...Switch-on state G code group 9, axis switch-over (17 - 22) .Invalid values cause the largest valid code of this group to be selected as switch-on state (M2) <*>

O20...numerical input limit for parameter G <99>
O21...numerical input limit for parameter M <99>

O22...minimum valid O-number for subroutines (0- 255) <80>

O40 ...MSD- bits
bit 0...ignore the software limit switches in manual mode. The bit is automatically deleted when confirming the next RESET (exception: in T/PSO mode or on the monitor) <0>
bit 1...tool measuring with reference workpiece (manual mode, T2)
bit 2...lock memory <0>
bit 3...lock control <0>
bit 4...activate workpiece counter <1>
bit 5...mode "workpiece presetting" <0>
bit 6...The alarm 570 with G41/42 is not emitted if it is caused by possible contour inaccuracies <0>
bit 7...Selection FMS mode <0>

O41...MSD-bits
bit 0...T1/M1-hardware (KM-thermo input inverted)
bit 1...control of the traversing range limit switch by means of the data controller (IS28 -30)
bit 2...control of only one push-switch and one final position control with automatic pneumatic clamping device -> old clamping device hardware.
bit 3...the reference point remains active with AUX OFF.
bit 4...Switch E5 (VMC200 swiveling position) is controlled.

O42...MSD-bits <*>
bit 0...IS15 (bar feed control input) is operated in inverted form -> 0V = alarm
bit 1...IS26 (thermo control hydraulic system) is operated in inverted form -> 0V = alarm
bit 2...IS27 (thermo control chip conveyor) is operated in inverted form -> 0V = alarm
bit 3...IS28 (thermo control oil mist separator) is operated in inverted form -> 0V = alarm

O45...activation of the laser adjusting operation. If this parameter is set to 255 it is possible to open the shutter with open door and shut safety key switch. In case of change of modes or reset this parameter is automatically reset to 0. <0>

R00...reference point in X <*>
R01...reference point in Y <M2: *, T2: 0.000>
R02...reference point in Z <*>

R03...software limit switch in +X <*>
R04...software limit switch in +Y <M2 : * T2: 10000.000>
R05...software limit switch in +Z <*>
R06...software limit switch in -X <*>
R07...software limit switch in -Y <M2 : * T2: -10000.00>
R08...software limit switch in -Z <*>

R09...safety distance of the software limit switches in manual mode <see table>

R10...reverse clearance? X-axis in um .)
R11...reverse clearance Y-axis in um) as from AC Vn.2.1, <*>
R12...reverse clearance Z-axis in um)

R13...VMC200: Z position, below which the "expanded sync" is controlled during the tool change procedure <see G05)
R14...M2 tool turret: swiveling position (Z axis) <*>

R15...Z offset of reference tool for optical tool presetting device, measured from the tool support zero point (T29 <-20,000> <-22,000 with ET242>

R16...position below which the air for blowing out the tool turret on the VMC tool turret is switched off. <*>

S00...minimum feed during G85/87/88 (T2) or G83/86 (M2) in ...<100>

S01...number of finishing cuts during G85 <0> (T2)

S02...return traverse during G86 (T2 and M2) and G87 (T2) <500>

T00...MSD-bits for axis controller
- bit 0...position-controlled main drive: the line 'main ;11 drive on/off' remains always on 'on' with switched-on control and switched-on auxiliary drives (except with EMERGENCY OFF) .
- bit 1...I2C-bus-control of main drive (as from AC 3.02)
- bit 2. ..axis standstill control with additional proximity detectors, cannot be activated any more as from AC5.11!
- bit 3...control of traversing range limit switches
- bit 4- 7: setting of time constant for acceleration procedure when positioning the main drive For values see table at the end

T01...MSD-bits for axis controller
Duration of dwell time period which one has to wait after starting the main spindle until scanning of the sync impulse is started to enable the position controller to adjust the position offset <3 for VMCl00>

T02...MSD-bits for axis controller
- bit 0...reserved for internal purposes
- bit 1...no axis control by AC (CHECK AXIS is skipped) Must be set in case the machine has no proximity detectors for axis control and the reference point is approached by the encoder via sync impulse.
- bit 2...identification bit for MC90
- bit 3...invert sync X ..acc. to standard to 0
- bit 4...invert sync Y " "
- bit 5...invert sync Z " "
- bit 6...=1 --> switch off speed control of main spindle
- bit 7...if set, prevents switch-on and off of the main drive contactor during a speed reverse on the main drive (not for position controlled main drives) here you have to set T01 bit0.

T03... Bit 0..3 time in multiples of 0.65s for the time delay during switch-over of the main drive to the wood working center
Bit 4...identification bit for laser
Bit 5. BG-control active: Here an additional control for MC90 and laser required by the trade association of Germany is activated. Now Jog operation and tool change with door open is only possible with the key switch.

T04. .time in tenths of seconds (0 ..25.5s) during which the speed control is stopped in additional to time T05. Pre-assignment: 15 (1.5s)
Laser: time in 0.5s units which is waited for a calibrating level: tcalib=3x+T4*=.5s, 6s standard.

T05...time in tenths of seconds (0 ..25.5s) for which the speed control is stopped in case of speed change.Pre-assignment: 40 (4S)

T06...bit 0.4: speed in 10 rpm (0..31 corr. to 0 ..310 rpm) below which a speed control is not possible any more. Pre-assignment: 20 (200 rpm)
bit 5: switch-off of relay control with BG safety circuit (alarm 173, MC90 and laser) .Must not be activated upon delivery.
Bit 6: switch-off of feed control for thread cutting (alarm 171) .This alarm was introduced as from AC6.00 and limits the possible feed to 80% of the express motion during thread cutting. Threads with higher feeds cannot be cut. However, some customers require it (possible with AC<6.00!) .With too large thread pitches the axis may come out of step; you have to point out this fact to customers where the control is switched off.

T07...tolerance dimension for carrying out a tangential block transition. It can be set between 0 and 255 and with 0 the tangent angles must fit exactly and with 255 the angles of the tangents may show a max. of 90 degree to still make a block transition. With increasing values, the contour inaccuracies on the transition positions are becoming larger. Setting value in wood woodworking center 80, in all the other machines 20.

T08...minimum output control value for calibration in [W]- <15>

T09...time function element for alarm 0 control (prevents the emission of alarm 0, when the axis controller blocks the command transfer AC -DC during longer acceleration procedures. Should be set only with machines with higher feeds/resolutions to values <> 0 and then also only to max. 2)

T10...MSD-bits for axis controller
bit 0...door limit switch input bridged over on AC (see D1)

T11...MSD-bits <*>
bit 0...X drive: sign reverse during jogging
bit 1...Y drive: sign reverse during jogging (M2)
bit 2...Z drive: sign reverse during jogging
bit 3.. X drive: start of reference point approaching in minus direction
bit 4...Y drive: start of reference point approaching in minus direction (M2)
bit 5...Z drive: start of reference point approaching in minus direction
bit 6...alarm 4 is emitted by Jog with open door (hardware change is carried out on new AC board)
bit 7...reference point limit switches for automatic reference point approaching are considered
Note: bit 3, 4, 5 have been introduced to be able to always approach the same internal position on the fixed reference point sign during reference point approaching)

T12...MSD-bits
bit 0...approaching the reference point first in X and then in Z <*>

T20...MSD-bits for Graphic mode
bit 0...activation of graphic key <*>
bit 1...graphic mode cannot be selected, switch-on state = Graphic <*>
bit 2...not assigned
bit 3...only for internal use: with set bit a hard copy of the actual screen display can be started in all operational states of the control by actuating the left upper key in the Jog key block <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T2I...Selection of monitor type <*>
bit 0...high resolution (30kHz line frequency)
bit 1...operation with two monitors
bit 2...line frequency for graphic monitor (30kHz)
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5....not assigned <0>
bit 6....test mode graphic controller/interface controller
bit 7....color screen (otherwise only black and white without intermediate gradation is displayed)

T22...planned: setting of language version <0>
0 ... second language

T23... pixel/mm (graphics) <3 for 9" I5kHz monitor <3>

T24... MSD-bits <*>
bit 0. ..suppression of sketch display (graphics)
bit 1...display of rotating edges (graphics, turning)

T25...display time for tools swiveled through (graphic mode)

T26...Default angle of view for 3D-representation (0-95)

T27...number of graphic tool turret positions <*>

T30...only for internal use: test modes IC
bit 0...IC displays actual values of CHARIN/CHAROUT <0>

T40...MSD-bits for activation of optional T2-G codes (T1) <*>
bit 0....G96 (T2)
bit 1...not assigned <0>
bit 2...not assigned <0>
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T41...MSD-bits for activation of optional T2/M2-G codes <*>
bit 0...G41/42
bit 1...G25
bit 2...not assigned <0>
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5....not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T42...MSD-bit for activation of optional M2-G codes (M2) <*>
bit 0...G17
bit 1...G18
bit 2...G19
bit 3...G20
bit 4...G21
bit 5...G22
bit 6...not assigned <0>
bit 7...not assigned <0>

T43...MSD-bits for activation of optional T2-M codes (T2) <*>.
Bit 0…M25/26
bit 1....M20/21
bit 2....M23/24 (can be activated also with M2)
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T44...MSD-bits for activation of optional T2/M2-M codes <*>
bit 0....M19
bit 1....M27
bit 2....M65
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T45...MSD-bits for activation of optional M2-M codes (M2) <*>
bit 0...M40/41
bit 1…M42/43
bit 2...not assigned <*>
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T46...MSD-bits
bit 0...activation of operational software for optical tool presetting device with T2 or for direct tool data transfer with M2
bit 1...activation of extended interface software for storing offsets on cassette/RS232
bit 2...activation of DNC interface
bit 3...not assigned <0>
bit 4...switch over to display for floppy disk drive
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T47...MSD-bits
bit 0...activation of chamfers and radii
bit 1...activation of contour scan
bit 2...not assigned <0>
bit 3...not assigned <0>
bit 4...not assigned <0>
bit 5...not assigned <0>
bit 6...not assigned <0>
bit 7...not assigned <0>

T48...MSD-bits
bit 0...activation 2nd spindle for MC90
bit 1...activation pick-up system (pneumatic tool magazine)
bit 2...pneumatic tool clamping in main spindle (not hydraulic)
bit 3...not used
bit 4...not used
bit 5...not used
bit 6...not used
bit 7...identification bit MC-90 (all versions)

X00...numerical input limit for parameter X <10000.00, with F1P 4000.000>

X01...numerical input limit for parameter y <10000.00, with F1P 4000.000>

X02...numerical input limit for parameter. Z <10000.00, with F1P 4000.000>

X03...numerical input limit for parameter U <10000.00, with F1P 4000.000>

X04...numerical input limit for parameter V <10000.00, with F1P 4000.000>

X05...numerical input limit for parameter W <10000.00, with F1P 4000.000>

X06...numerical input limit for parameter I <10000.00, with F1P,4000.000>

X07...numerical input limit for parameter J <10000.00, with F1P 4000.000>

X08...numerical input limit for parameter K <10000.00, with FIP 4000.000>

X09...numerical input limit for parameter R <99.998, with FIP 65.535>

X10...numerical input limit for parameter P <10000.00, with FIP 4000.000>

TABLE OF TYPE SPECIFIC SETTING PARAMETERS

	ET120	ET220	ET140	ET242	FIP	F3CNC	VMC100	VMC200
F01	1000	2200	2200	4000	700	2200	2200	4000
F02	1000	2000	2000	3000	1000	2000	2000	3000
F03	700	1000	1000	3000	700	1000	1000	3000
F05	700	1500	1500	5000	700	1500	1500	5000
F06	2000	3000	3000	12000	1000	3000	3000	12000
F07	2000	3000	3000	12000	1000	3000	3000	12000
F08	2000	3000	3000	12000	1000	3000	3000	12000
F09	1000	1000	1000	2500	1000	1000	1000	2500
F20	2000	2000	2000	2000	5000	2000	2000	2400
F21	2000	2000	2000	0	5000	2000	2000	2400
F22	2000	2000	2000	2000	5000	2000	2000	2400
F23	2500	3500	2500	4000	1600	2500	3500	4000
F24	400	400	400	400	1000	400	400	400
L30	20	148	20	148	20	148	138	148
L31	0	80	0	80	0	80	80	90
M00	20	13	15	200	8	18	*500	200
M0l	280	280	280	750	570	280	760	750
M02	1040	1040	1040	78	1890	1040	* 78	78
M03	150	150	150	2000	83	150	*2000	2000
M04	4000	6300	2500	4500	4000	2200	4000	4500
M05	150	150	150	10	150	80	10	10
NO3	899	899	899	899	9999	9999	1099	1299
NO5	4000	6300	2500	4500	4000	2200	4000	3800
NO6	899	899	899	899	9999	9999	1099	1299
R09	10.000	10.000	20.000	20.000	10.000	20.000	10.000	15.000

Note: The setting values for parameters MI, M2 and M3 are standard values and must be adjusted machine specifically.

* M0,M2,M3 valid for VMC100 with new main drive TRST YIA410001 (old main drive: M=250, M2=156, M3=1000)

* Values for tool turret VMC100, VMC200 depending on the software version:

All values can be changed if required upon start-up.

T00 acceleration time constant for main drive suited for positioning (bit 4...7). Larger values mean slower acceleration.

G3 positioning speed of main drive during tool change

G6 dwell time between two positioning procedures during tool change.

		<=AC4.02	>=AC4.03	>=AC5.0
VMC100	TO	33	17	49
	G3	20	50/20 *	30
	G6	<=2	<=2	0
VMC200	T0	43	43	123
	G3	50	20	20
	G6	4	4	5

*) 50 for VMC100 with new drive TRST Y1A 410001 20 for VMC100 with old main drive

SOFTWARE DEVELOPMENT, 18-09-91