



System DELTA Programmer's Reference

121297

CPU Module Registers

General Register Survey (all modules)

0 .. 20479	24 bit user register
21000 .. 24999	Slave registers slot 2
31000 .. 34999	Slave registers slot 3
41000 .. 44999	Slave registers slot 4
50200 .. 59999	Network registers
61440 .. 64999	System / special registers

Operating System (Error) Messages

61473	Operating system errors (special flags 2104 .. 2111)
bit0 = 0	no timeout slave register access
bit0 = 1	timeout slave register access
bit1 = 0	no timeout slave register access since reset
bit1 = 1	timeout slave register access since reset
bit3 = 0	no error
bit3 = 1	SPECIALFUNCTION 1 error: more than 99 parameters
bit6 = 0	no timeout last network access
bit6 = 1	timeout last network access
bit7 = 0	no network timeout since reset
bit7 = 1	network timeout since reset

61477	Operating system errors (special flags 2136 .. 2143)
If 61477 ≠ 0	ERR-LED (red) lights
bit0 = 1	illegal branch destination for GOTO or CALL. Task was broken
bit1 = 1	actual instruction would cause stack overflow. Task was broken
bit2 = 1	actual instruction would cause stack underflow. Task was broken
bit3 = 1	no user program or CRC error
bit4 = 1	OPC error
61478	Operating system errors, messages
bit0 = 1	digital output error
bit1 = 1	RTC identified
bit2 = 1	RTC battery Ok
bit3 = 1	battery for register RAM soon exhausted
61530	Task number of OPC error
61952	Run time user program in s
61953	Controller run time since reset in s
61954	Controller run time in user time base units
61956	Controller run time since reset in ms
62977	Operating system version * 100

Task Control

61449	Priority task
61467	Task switch conditions (special flags 2056 .. 2063)
	Task switch always if
	o DELAY
	o USERINPUT
	o WHEN (not fulfilled)
	and also if
	o flag 2056 AND task switch time out (61804)
	o flag 2057 AND GOTO
	o flag 2058 AND IF (not fulfilled)
	bit0 = flag 2056
	bit0 = 0 no task switch on timeout
	bit0 = 1 task switch on timeout
	bit1 = flag 2057
	bit1 = 0 no task switch at GOTO
	bit1 = 1 task switch at GOTO
	bit2 = flag 2058
	bit2 = 0 no task switch at IF (not fulfilled)
	bit2 = 1 task switch at IF (not fulfilled)

61474	Multitasking Control (special flags 2112 .. 2119)
bit0 = 0	SYMPAS, LCD operation before TASKO
bit0 = 1	SYMPAS, LCD before each task
bit5 = 0	N-SEND-REGISTER, N-GET-REGISTER are interrupted
bit5 = 1	N-SEND-REGISTER, N-GET-REGISTER are not interrupted
61531..	
61562	Task states: 255 = task running, 254 = delay, 253 = user input, 250 = WHEN_MAX, 1 = TASKBREAK, 0 = stopped
61610	Greatest user task number
61773	Minimum cycle time (61777)
61774	Maximum cycle time (61777)
61777	Cycle time of all tasks
61804	Task timeout time

User Interface Control (LCD Displays)

61448	Display language, 0 = german, 1 = english
61451	Field width for floating point register display
61452	Number of places behind point
61453	Field width for integer register display
61454	Flush left number display
61455	Field width USERINPUT
61461	Delete to end of line character
61462	Clear display character
61472	Monitor function restriction, 0=disable, 1=enable
bit0 = 0	R, I/O key without monitor function (but sets flag)
bit0 = 1	R key with monitor function
bit1 = 0	R key without monitor function
bit1 = 1	R, I/O key with flag input function
bit2 = 0	R, I/O key without output number input
bit2 = 1	R, I/O key with output number input
bit3 = 0	R, I/O key without input number input
bit3 = 1	R, I/O key with input number input
bit4 = 0	= key can not change register content
bit4 = 1	= key changes register content
bit5 = 0	= key can not change flags
bit5 = 1	= key changes flags
bit6 = 0	= key can not change outputs
bit6 = 1	= key changes outputs
bit7 = 0	= key has no acces to inputs
bit7 = 1	= key display input state

61480..
 61487 User interface keys (special flags 2160 .. 2223)
 61488..
 61489 User interface LED (special flags 2224 .. 2239)
 61648 Absolute cursor position cp=0 for DISPLAY_TEXT and DISPLAY_REG
 61649 Absolute cursor position cp=0 for USER_INPUT
 61653 Display time of monitor functions
 61683 Text selection for DISPLAY_TEXT_2
 0 = text 1, 1 = text 2
 61696 First by LCD changeable register - range 1
 61697 Last by LCD changeable register - range 1
 61698 First by LCD changeable register - range 2
 61699 Last by LCD changeable register - range 2
 61700 First by LCD changeable register - range 3
 61701 Last by LCD changeable register - range 3
 61702 First by LCD changeable flag
 61703 Last by LCD changeable flag
 61818 max time for user input, default=0 (disabled)
 61825 Number of characters per line
 61826 Number of lines
 61827 Number of characters (61825 * 61826)
 62677 User interface LED (bit 0 .. 11, overlaid with registers 61488, 61489)
 62964 User interface baud rate (0 .. 15)

Programming (PC) Interface Control

62983 Programming interface baud rate (0 .. 15)
 Initialized by 63238 at power-up
 63238 Baud rate pointer programming interface (EEPROM, see 62990).

User Program Status

61440 bit0 = 0 user program stopped
 bit0 = 1 user program runs
 61529 Flip switch position at power-up:
 Stop = 0, Run = 2, Load = 1
 62976 Current flip switch position:
 Stop = 0, Run = 2, Load = 1

Network Control

61584 Network number
 61585 Time until response (ms)
 61586 Network instruction time
 61588 Timeout time network access
 61589 Indirect network number
 61828 50000er offset for inputs
 61829 50000er offset for outputs
 61830 50000er offset for flags
 61831 50000er offset for registers
 61955 Number checksum errors network receiving
 62995 Network 1 number
 62996 Baud rate network 1
 63241 Network 1 number at power-up (EEPROM)
 63242 Baud rate index network 1 (EEPROM, see 62990)

Network Interface 2 / PRIM Interface Control

61499 Receiving buffer level
 61502 Transmission buffer level
 61508 Interface status
 bit0 = 1 lost one or more characters during receiving
 bit1 = 1 stop bit error
 bit2 = 1 parity error
 bit3 = 1 bit 0 to 2 is or was not 0
 bit4 = 1 receiving buffer overflow
 bit5 = 1 transmission buffer overflow
 61512 Master timeout
 62989 Configuration
 bit0 0=PRIM, 1=net 2
 bit1 reserved
 bit2 0=1, 1=2 stop bit
 bit3 0=7, 1=8 bit per character
 bit5,4 00 = no parity
 01 = prohibited
 10 = odd parity
 11 = even parity
 bit7,6 00 = RS232
 01 = RS485 (4 wire)
 10 = RS422
 11 = RS485 (2 wire)
 Default: PRIM, RS232, 8N1, 9600 baud
 62990 Baudrate

0 150
 1 300
 2 600
 3 1200
 4 2400
 5 4800
 6 9600 default
 7 19200
 8 38400
 9 57600
 10 76800
 11 .. 14 115200
 62991 Network 2 number
 62992 Transmission buffer
 62993 Receiving buffer with character removing
 62994 Receiving buffer without character removing

Controller Board Access (SV, SM, PID)

Flag 2105 = 1 indicates an error
 62150 Slave process access error: slot number -1
 62151 Slave process access error: axis number -1
 62152 Slave process access error: register number

Timer Registers

61645 Number of timer registers
 61708..
 61739 Task timer registers
 61806 User time base in ms
 61848 Time base for START-TIMER, TIMER-END?

Real Time Clock Control

62912..
 62919 RTC buffer, no access to RTC
 62920..
 62927 RTC direct, transfer of all registers
 62912, 62920 Seconds
 62913, 62921 Minutes
 62914, 62922 Hours
 62915, 62923 24 hour format 0, 12 hour format:

0=am, 128=pm
 62916, 62924 Day of week, 1 = sunday
 62917, 62925 Day
 62918, 62926 Month
 62919, 62927 Year
 63240 RTC configuration (EEPROM)
 bit0 = 1 summer / winter time enabled
 bit1 = 0 am / pm format
 1 24 hour format

Floating Point Registers

62208..
 62463 Floating point registers

General registers

61684 Bitcode of slots and plugged-in boards
 62985 Single channel counter (digital input IN2)

Combined Inputs

8 Combined Inputs

62464 Inputs 101 .. 108
 62465 Inputs 109 .. 116
 62466 Inputs 117 .. 124
 62467 Inputs 125 .. 132
 62468 Inputs 133 .. 140
 62469 Inputs 141 .. 148
 62470 Inputs 149 .. 156
 62471 Inputs 157 .. 164
 62472 Inputs 201 .. 208
 62473 Inputs 209 .. 216
 62474 Inputs 217 .. 224
 62475 Inputs 225 .. 232
 62476 Inputs 233 .. 240
 62477 Inputs 241 .. 248
 62478 Inputs 249 .. 256
 62479 Inputs 257 .. 264
 62480 Inputs 301 .. 308
 62481 Inputs 309 .. 316

62482 Inputs 317 .. 324
 62483 Inputs 325 .. 332
 62484 Inputs 333 .. 340
 62485 Inputs 341 .. 348
 62486 Inputs 349 .. 356
 62487 Inputs 357 .. 364
 62488 Inputs 401 .. 408
 62489 Inputs 409 .. 416
 62490 Inputs 417 .. 424
 62491 Inputs 425 .. 432
 62492 Inputs 433 .. 440
 62493 Inputs 441 .. 448
 62494 Inputs 449 .. 456
 62495 Inputs 457 .. 464

16 Combined Inputs

62528 Inputs 101 .. 116
 62529 Inputs 109 .. 124
 62530 Inputs 117 .. 132
 62531 Inputs 125 .. 140
 62532 Inputs 133 .. 148
 62533 Inputs 141 .. 156
 62534 Inputs 149 .. 164
 62535 Inputs 157 .. 164
 62536 Inputs 201 .. 216
 62537 Inputs 209 .. 224
 62538 Inputs 217 .. 232
 62539 Inputs 225 .. 240
 62540 Inputs 233 .. 248
 62541 Inputs 241 .. 256
 62542 Inputs 249 .. 264
 62543 Inputs 257 .. 264
 62544 Inputs 301 .. 316
 62545 Inputs 309 .. 324
 62546 Inputs 317 .. 332
 62547 Inputs 325 .. 340
 62548 Inputs 333 .. 348
 62549 Inputs 341 .. 356
 62550 Inputs 349 .. 364
 62551 Inputs 357 .. 364
 62552 Inputs 401 .. 416
 62553 Inputs 409 .. 424
 62554 Inputs 417 .. 432
 62555 Inputs 425 .. 440
 62556 Inputs 433 .. 488

62557 Inputs 441 .. 456
 62558 Inputs 449 .. 464
 62559 Inputs 457 .. 464

24 Combined Inputs

62592 Inputs 101 .. 124
 62593 Inputs 109 .. 132
 62594 Inputs 117 .. 140
 62595 Inputs 125 .. 148
 62596 Inputs 133 .. 156
 62597 Inputs 141 .. 164
 62598 Inputs 149 .. 164
 62599 Inputs 157 .. 164
 62600 Inputs 201 .. 224
 62601 Inputs 209 .. 232
 62602 Inputs 217 .. 240
 62603 Inputs 225 .. 248
 62604 Inputs 233 .. 256
 62605 Inputs 241 .. 264
 62606 Inputs 249 .. 264
 62607 Inputs 257 .. 264
 62608 Inputs 301 .. 324
 62609 Inputs 309 .. 332
 62610 Inputs 317 .. 340
 62611 Inputs 325 .. 348
 62612 Inputs 333 .. 356
 62613 Inputs 341 .. 364
 62614 Inputs 349 .. 364
 62615 Inputs 357 .. 364
 62616 Inputs 401 .. 424
 62617 Inputs 409 .. 432
 62618 Inputs 417 .. 440
 62619 Inputs 425 .. 448
 62620 Inputs 433 .. 456
 62621 Inputs 441 .. 464
 62622 Inputs 449 .. 464
 62623 Inputs 457 .. 464

Combined Outputs

8 Combined Outputs

62720	Outputs	101 .. 108
62721	Outputs	109 .. 116
62722	Outputs	117 .. 124
62723	Outputs	125 .. 132
62724	Outputs	133 .. 140
62725	Outputs	141 .. 148
62726	Outputs	149 .. 156
62727	Outputs	157 .. 164
62728	Outputs	201 .. 208
62729	Outputs	209 .. 216
62730	Outputs	217 .. 224
62731	Outputs	225 .. 232
62732	Outputs	233 .. 240
62733	Outputs	241 .. 248
62734	Outputs	249 .. 256
62735	Outputs	257 .. 264
62736	Outputs	301 .. 308
62737	Outputs	309 .. 316
62738	Outputs	317 .. 324
62739	Outputs	325 .. 332
62740	Outputs	333 .. 340
62741	Outputs	341 .. 348
62742	Outputs	349 .. 356
62743	Outputs	357 .. 364
62744	Outputs	401 .. 408
62745	Outputs	409 .. 416
62746	Outputs	417 .. 424
62747	Outputs	425 .. 432
62748	Outputs	433 .. 440
62749	Outputs	441 .. 448
62750	Outputs	449 .. 456
62751	Outputs	457 .. 464

16 Combined Outputs

62784	Outputs	101 .. 116
62785	Outputs	109 .. 124
62786	Outputs	117 .. 132
62787	Outputs	125 .. 140
62788	Outputs	133 .. 148
62789	Outputs	141 .. 156

62790	Outputs	149 .. 164
62791	Outputs	157 .. 164
62792	Outputs	201 .. 216
62793	Outputs	209 .. 224
62794	Outputs	217 .. 232
62795	Outputs	225 .. 240
62796	Outputs	233 .. 248
62797	Outputs	241 .. 256
62798	Outputs	249 .. 264
62799	Outputs	257 .. 264
62800	Outputs	301 .. 316
62801	Outputs	309 .. 324
62802	Outputs	317 .. 332
62803	Outputs	325 .. 340
62804	Outputs	333 .. 348
62805	Outputs	341 .. 356
62806	Outputs	349 .. 364
62807	Outputs	357 .. 364
62808	Outputs	401 .. 416
62809	Outputs	409 .. 424
62810	Outputs	417 .. 432
62811	Outputs	425 .. 440
62812	Outputs	433 .. 488
62813	Outputs	441 .. 456
62814	Outputs	449 .. 464
62815	Outputs	457 .. 464

24 Combined Outputs

62848	Outputs	101 .. 124
62849	Outputs	109 .. 132
62850	Outputs	117 .. 140
62851	Outputs	125 .. 148
62852	Outputs	133 .. 156
62853	Outputs	141 .. 164
62854	Outputs	149 .. 164
62855	Outputs	157 .. 164
62856	Outputs	201 .. 224
62857	Outputs	209 .. 232
62858	Outputs	217 .. 240
62859	Outputs	225 .. 248
62860	Outputs	233 .. 256
62861	Outputs	241 .. 264
62862	Outputs	249 .. 264
62863	Outputs	257 .. 264
62864	Outputs	301 .. 324

62865	Outputs	309 .. 332
62866	Outputs	317 .. 340
62867	Outputs	325 .. 348
62868	Outputs	333 .. 356
62869	Outputs	341 .. 364
62870	Outputs	349 .. 364
62871	Outputs	357 .. 364
62872	Outputs	401 .. 424
62873	Outputs	409 .. 432
62874	Outputs	417 .. 440
62875	Outputs	425 .. 448
62876	Outputs	433 .. 456
62877	Outputs	441 .. 464
62878	Outputs	449 .. 464
62879	Outputs	457 .. 464

Overlay Flag-Registers

0	256 .. 279
1	280 .. 303
...	
74	2032 .. 2047

Servo / DIMA Module Registers

Register Number Pattern

xyzzz x is slot number 2,3,4
y is axis number 1,2,3,4,(42)
z is register number 0 .. 999

Axis Number Pattern

xy x is slot number 2,3,4
y is axis number 1 axis 1
2 axis 2
3 axis 3
4 axis 4
(42 axis 42)

xy000 Status register
bit0 referenced
bit1 AXXAR position was reached
bit2 actual position in destination window
bit3 tracking error recognized
bit4 negative limit switch active
bit5 positive limit switch active
bit6 reference switch active
bit7 software limit switch was active
bit8 limit switch was active
bit9 position controller active
bit10 'control after AXARR' active
bit11 motion controller active
bit12 reference run error
bit13 BUSY (only for commands 9 to 12, 42)
bit14 software limit switch active
(write access activates the function)
bit15 reserved
bit16 axis within stop ramp
bit17 do not deactivate on tracking error
(write access activates the function)
bit18 found no print mark
bit19 only DIMA: amplifier error
bit20 only DIMA: resolver error
bit21 only DIMA: overheat motor

xy001 bit22, 23 reserved
Command register
0 AXARR with stop ramp
1 Activate and release all controllers
2 cancel controller release
3 set reference
4 clear reference
5 AXARR with position control
6 AXARR without position control
7 activate position control after AXARR
8 deactivate position control after AXARR
9 automatic reference run, -> +, rec. ref
10 automatic reference run, -> -, rec. ref
11 automatic reference run, -> +, ign. ref
12 automatic reference run, -> -, ign. ref
13 output 10V (for test purposes)
14 deactivate command 13
15 global axis activation
16 global axis deactivation
17 relative positioning
18 absolute positioning
19 continue broken relative positioning
20 activate positioning with start input
21 deactivate positioning with start input
22 activate halt at reference point
23 deactivate halt at reference point
24 annex next interpolation
25 combine circle and linear interpolation
26 activate print mark recognition
27 deactivate print mark recognition
28 .. 31 reserved
32, 33 axis is slave
38 axis 4 is master, only both axes of the modul are slaves
39 axis 4 is master, both axes of the modul are slaves and there are external slaves
40 axis 4 is master, only axis 3 of the master module and external axis are slaves
41 start interpolation
42 cancel interpolation mode
43 axis 4 is master, only axis 1 of the master module and external axis are slaves
44 activate follower
45 deactivate follower
46 activate follower by table
47 activate follower by factor/divisor

48 right rotation direction
49 left rotation direction
50 optimize distance
51 deactivate commands 48 to 50
56 endless positioning in positive direction
57 endless positioning in negative direction
72 analog speed acquisition
73 analog speed acquisition
xy002 Nominal position
xy003 Nominal speed
xy004 Input polarities
xy005 Start ramp
xy006 Stop ramp
xy007 Destination window
xy008 Digital offset
xy009 Actual position
xy010 P gain of position controller
xy011 Nominal speed of the position controller
xy012 Actual speed
xy014 Positive software limit switch
xy015 Negative software limit switch
xy016 Digital analog offset
xy017 Number of encoder lines
xy018 Maximum speed of servo/motor combination
xy019 Tracking error
xy020 Tracking error threshold
xy021 Reference value for register xy003
xy022 Relation user/encoder resolution
xy023 SV4: Selection of LED meaning
DIMA: Number of pole pairs
xy024 P gain of digital speed loop
xy025 Nominal current
xy026 I coefficient speed loop
xy027 Current limitation of speed loop
xy028 Current I coefficient of speed loop
xy029 I coefficient limitation of speed loop
xy030 Nominal position axis 1 of master module
xy031 Nominal position axis 2 of master module
xy032 Nominal position external slave
xy033 Nominal position external slave
xy038 Actual position of the external axis for calculation of the diagonal
xy039 Actual position of the external axis for calculation of the diagonal
xy040 Length of software axis
xy041 Center axis 1

xy042 Center axis 2
xy045 Nominal angle of circle interpolation
xy046 Calculated radius of circle interpolation
x5047 Calculated start angle
x5048 Calculated arc length
x1049 Calculated destination position axis 1
x3050 Calculated destination position axis 2
xy051 Adaption of maximum speed to data axis
xy052 Adaption of different encoder resolutions
xy053 Pointer to table element
xy054 Value of table element
xy055 Number of table elements
xy056 Factor master to slave
xy057 Divisor master to slave
xy058 Positive maximum position of master
xy059 Negative maximum position of master
xy060 Increase limitation of follower
xy061 Print mark position
xy062 Print mark tolerance
xy063 Maximum print mark correction
xy064 Encoder word width
xy065 Offset for reference position
xy066 Bit mask word width
xy067 Relative position for positioning with start input
xy068 Last nominal position of relative mode
x1082 Counter - path parts
x1083 Level register memory
xy085 Absolute maximum position
x1098 Mode selection
bit0 = 0 analog speed loop
bit0 = 1 digital speed loop (DIMA always 1)
bit1 = 0 SV3 mode
bit1 = 1 SV4 mode
bit2 = 0 cam funktion OFF (special function)
bit2 = 1 cam funktion ON (special function)
x1099 Version number

PID Controller Module Registers

Register Number Pattern

xyzzz x is slot number 2,3,4
y is axis number 1,2,3,4,(42)
z is register number 0 .. 999

xy000 Status register
bit0 controller1 0=off 1=on
bit1 controller2 0=off 1=on
bit2 controller3 0=off 1=on
bit3 controller4 0=off 1=on
bit4 out1,2 0=ana 1=PWM
bit5 out3,4 0=ana 1=PWM
bit6 alarm PWM out 0=off 1=on
bit7 contr1: current <2mA on 4-20mA inp
bit8 contr2: current <2mA on 4-20mA inp
bit9 contr3: current <2mA on 4-20mA inp
bit10 contr4: current <2mA on 4-20mA inp
bit11..23 reserved

xy001 Command register
1 activate controller
2 deactivate controller
3 clear I coefficient
4 activate PWM+
5 deactivate PWM+
6 activate PWM-
7 deactivate PWM-
8 auto calibration
12 deactivate controller,
controlled variable remains
13 set I coefficient to xy017

xy002 Nominal value
xy003 P gain
xy004 Adjustment time T_N (I coefficient)
xy005 Rate time T_V (D coefficient)
xy006 Sample time T
xy007 I limitation
xy008 Increase limitation
xy010 PWM period time
xy011 Assignment input - controller
xy012 Assignment output - controller

xy017 Output value, direct
xy018 I coefficient
xy019 Output value (normalized, scaled)
xy020 Threshold - controller activation
x1023 Number of activable controller (global)
x1030 Software version
x1041..
x1048 Actual value (normalized, scaled)
x1051..
x1058 Actual value, direct
x1061..
x1068 Input configuration
x3061..
x3064 Output configuration
x1071..
x1078 Lower limit input scaling
x1081..
x1088 Upper limit input scaling
x1091..
x1094 Lower limit output scaling
x1095..
x1098 Upper limit output scaling

	-10 .. +10V	8
Difference	-20 .. +20mA	7
	4 .. 20mA	21
	-10 .. +10V	12

x3051 (Input 1) .. x3058 (Input 8)

x is slot number (2 .. 8)

Value range: ± 32767

DA-Module Registers

Plug DA-Module into submodule slot **Modul 3**

x3110 (Output 1) .. x3113 (Output 4)

x is slot number (2 .. 8)

Value range: ± 32767

AD-Module Registers

Plug AD-Module into submodule slot **Modul 3**

x1061..
x1068 Input configuration
Single ended -20 .. +20mA 3
4 .. 20mA 17

Programming Language

Instructions

ACTUAL_POS	AP
AXARR	AX
BIT_CLEAR	BC
BIT_SET	BS
CALL	CA
CLEAR_FLAGS	CF
COPY	CO
DELAY	DE
DISPLAY_REG	DR
DISPLAY_TEXT	DT
ELSE	E
FLAG	F
GOTO	G
IF	IF
IN	IN
LABEL	LA
LIMITS	LI
NET-GET-REGISTER	NG
NET-SEND-REGISTER	NS
NOT	NO
NOP	NP
OR	OR
OUT	OU
POS	PO
REG	RE
REG_CLEAR	RC
REGDEC	RD
REGINC	RI
REGISTER_LOAD	RL
REGZERO	RZ
RETURN	RT
START-TIMER	S
TASKBREAK	TB
TASKCONTINUE	TC
TIMER-END?	TE
TASKRESTART	TR
THEN	TH
USER_INPUT	U
WAND	WA
WHEN	WH

WHEN_MAX	WM
WOR	WO
WXOR	WX

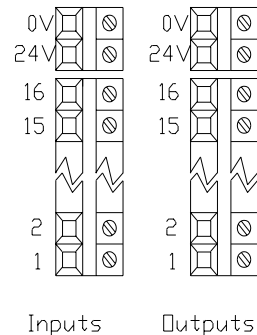
Numbers:

Binary number	NB
Decimal number	ND
Hexadecimal number	NH

Terminal Description

1 CPU Module Terminals

1.1 Power Supply



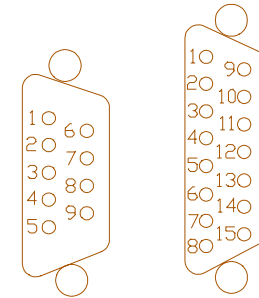
Input Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Logic
24V	24VDC	Logic

Output Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Supply of outputs
24V	24VDC	Supply of outputs

1.2 Connection to PC, VIADUKT



PC (9 pin Sub-D female)

Terminal	Signal	Meaning
2	TxD	RS232
3	RxD	RS232
7	Gnd	

1.3 Connection to the LCD

LCD - RS232 (15 pin Sub-D female)

Terminal	Signal	Meaning
2	TxD	RS232
3	RxD	RS232
4	+24V	Power supply
7	Gnd	

LCD - Open Collector (15 pin Sub-D female)

Terminal	Signal	Meaning
10	TxD	Open collector
12	RxD	Open collector
4	+24V	Power supply
7	Gnd	

LCD - RS422 (15 pin Sub-D female)

Terminal	Signal	Meaning
11	SDA	RS422
10	SDB	RS422
13	RDA	RS422
12	RDB	RS422
4	+24V	Power supply
7	Gnd	

ATTENTION

All mass connections (Gnd) are attached to the controller internal mass connections, the controller housing and the housings of the Sub-D connectors.

1.4 Network Connection

Net 1 - RS485 (9 pin Sub-D female)

Terminal	Signal	Meaning
8	D+	RS485
9	D-	RS485
5	RTS+	RS485
6	RTS-	RS485
1	+5V	Power supply
7	Gnd	

Net 2 - RS485 (9 pin Sub-D female)

Terminal	Signal	Meaning
8	D+	RS485
9	D-	RS485
5	RTS+	RS485
6	RTS-	RS485
1	+5V	Power supply
7	Gnd	

Net 2 - RS422 and RS485 4 wire (9 pin Sub-D female)

Terminal	Signal	Meaning
9	SDA	RS422, RS485
8	SDB	RS422, RS485
6	RDA	RS422, RS485
5	RDB	RS422, RS485
1	+5V	Power supply
7	Gnd	

Net 2 - RS232 (9 pin Sub-D female)

Terminal	Signal	Meaning
2	TxD	RS232
3	RxD	RS232
7	Gnd	

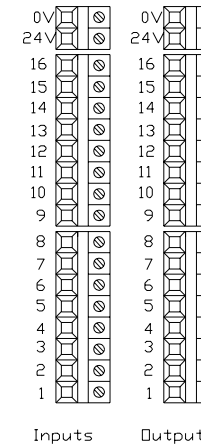
ATTENTION

All mass connections (Gnd) are attached to the controller internal mass connections, the controller housing and the housings of the Sub-D connectors.

The 5V power supply lines of the network interfaces are isolated from the controller internal 5V power supply lines. The 5V power supply lines of both network interfaces are isolated from each other.

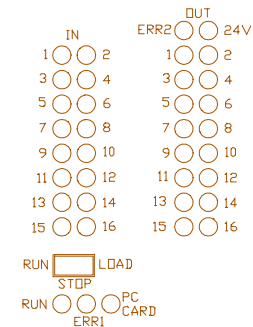
External devices can be supplied with the **Power supply** lines.

1.5 Digital Inputs and Outputs



On the left side are the digital inputs, on the right side are the digital outputs. Both, inputs and outputs are numbered from 1 to 16.

1.6 LED Description



IN1 .. 16
OUT1 .. 16
RUN

digital inputs
digital outputs
lights:
operating system runs,
user program runs
blinking:
operating system runs,
user program was stopped

ERR1	off: operating system error, ERR1 lights operating system error; The error state is in register 61477. The user program can access to this error state
PC CARD	reserved
ERR2	digital output driver: overload, overtemperature, cable break one or more outputs
24V	external supply of the 24V digital outputs

1.7 Switch Description



RUN Position

The user program is executed. The switch position is only evaluated at power-on not during operation.

STOP Position

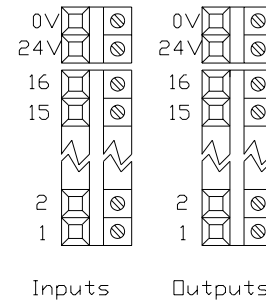
The user program is not executed after power-on. The switch position is only evaluated at power-on not during operation.

LOAD Position

This switch position is used for operating system download. The operating system can be read via PC interface or from a PC Card.

2. Servo Module Terminals

2.1 Power Supply



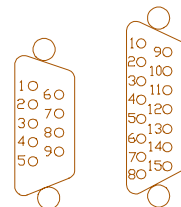
Input Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Logic
24V	24VDC	Logic

Output Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Supply of outputs
24V	24VDC	Supply of outputs

2.2 Servo Amplifier Connection



9 pin Sub-D female

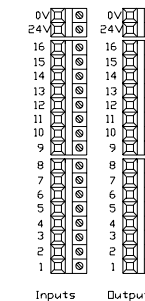
Terminal	Signal	Meaning
9	Speed nominal value	-10V .. +10V
8	Gnd for 9	
1	Gnd for encoder	
3	Release (relay)	Contact1
4	Release (relay)	Contact2

2.3 Connection to incremental or absolute encoder

15 pin Sub-D female

Terminal	Signal	Meaning
1	Gnd for encoder	
2	K0+	
3	K0-	
4	K1+, D+ (SSI)	
5	K1-, D- (SSI)	
6	K2+	
7	K2-	
8	SSI clock -	
9	SSI clock +	
10	5 VDC	Power supply

2.4 Digital Inputs and Outputs



On the left side are the digital inputs, on the right side are the digital outputs. Both, inputs and outputs are numbered from 1 to 16.

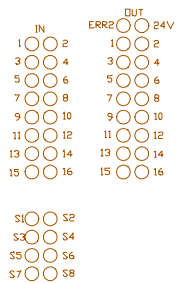
2.5 Limit and Reference Switches

The limit respectively the reference switches are connected to the digital inputs.

Digital inputs

Terminal	Signal	Meaning
Input 1	Limit + axis 1	Limit switch
Input 2	Limit - axis 1	Limit switch
Input 3	Reference axis 1	Reference switch
Input 4	Limit + axis 2	Limit switch
Input 5	Limit - axis 2	Limit switch
Input 6	Reference axis 2	Reference switch

2.6 LED Description



IN1 .. 16 digital inputs
 OUT1 .. 16 digital outputs
 ERR2 digital output driver: overload, overtemperature, cable break one or more outputs

24V external supply of the 24V digital outputs

Following states are indicated if register x1023 = 0

- S1 positive limit switch axis 1 is or was active
- S2 axis 1 reached position (LED lights when axis 1 reaches the destination window and extinguishes when a new position is started)
- S3 negative limit switch axis 1 is or was active
- S4 positive limit switch axis 3 is or was active
- S5 axis 3 reached position (LED lights when axis 3 reaches the destination window and extinguishes when a new position is started)
- S6 negative limit switch axis 3 is or was active
- S7 reserved
- S8 reserved

The limit switch LED have different indication modes
 continuous light: axis stands at the limit switch, the limit switch is active

equal blinking: the limit switch was active, is not active and no new positioning was started

unequal blinking: the software limit switch was triggered

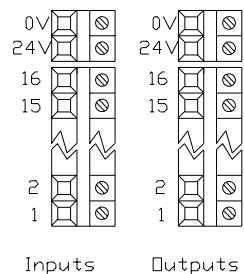
Following states are indicated if register x1023 = 1

- S1 voltage at the K0 input of axis 1 (positive means LED on)
- S2 voltage at the K1 input of axis 1
- S3 voltage at the K2 input of axis 1
- S4 voltage at the K0 input of axis 3
- S5 voltage at the K1 input of axis 3
- S6 voltage at the K2 input of axis 3
- S7, S8 reserved

<-

3. DIMA Module Terminals

2.1 Power Supply



Input Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Logic
24V	24VDC	Logic

Output Terminal Block

Terminal	Signal	Meaning
0V	Gnd	Supply of outputs
24V	24VDC	Supply of outputs

2.2 Resolver Connection

9 pin Sub-D female

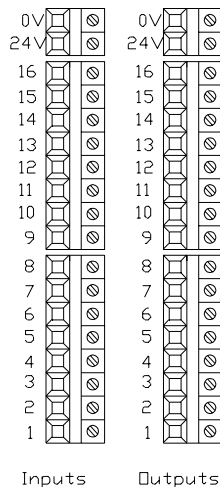
Terminal	Signal	Meaning
1	R1	exciting winding +
6	R2	exciting winding -
2	S4	input sine +
7	S2	input sine -
3	S3	input cosine +
8	S1	input cosine -

2.3 Connection to the amplifier

26 pin Sub-D female

Pin 1 to pin 18 of the two cable connectors correspond directly to its counterparts of the other connector.

2.4 Digital Inputs and Outputs



On the left side are the digital inputs, on the right side are the digital outputs. Both, inputs and outputs are numbered from 1 to 16.

2.5 Limit and Reference Switches

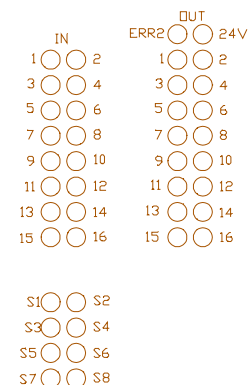
The limit respectively the reference switches are connected to the digital inputs.

Digital inputs

Terminal	Signal	Meaning
Input 1	Limit + axis 1	Limit switch
Input 2	Limit - axis 1	Limit switch
Input 3	Reference axis 1	Reference switch

Input 4	Limit + axis 2	Limit switch
Input 5	Limit - axis 2	Limit switch
Input 6	Reference axis 2	Reference switch

2.6 LED Description



IN1 .. 16 digital inputs
 OUT1 .. 16 digital outputs
 ERR2 digital output driver: overload, overtemperature, cable break one or more outputs
 24V external supply of the 24V digital outputs

Following states are indicated if register x1023 = 0

S1 positive limit switch axis 1 is or was active
 S2 axis 1 reached position (LED lights when axis 1 reaches the destination window and extinguishes when a new position is started)
 S3 negative limit switch axis 1 is or was active
 S4 positive limit switch axis 3 is or was active
 S5 axis 3 reached position (LED lights when axis 3 reaches the destination window and extinguishes when a new position is started)

S6 negative limit switch axis 3 is or was active

S7 reserved

S8 reserved

The limit switch LED have different indication modes

continuous light: axis stands at the limit switch, the limit switch is active

equal blinking: the limit switch was active, is not active and no new positioning was started

unequal blinking: the software limit switch was triggered

Following states are indicated if register x1023 = 1

S1 reserved

S2 voltage at the K0 input of axis 1
(positive means LED on)

S3 voltage at the K1 input of axis 1

S4 voltage at the K2 input of axis 1

S5 voltage at the K0 input of axis 3

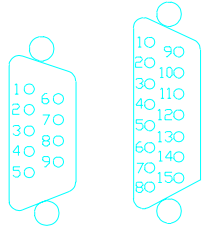
S6 voltage at the K1 input of axis 3

S7 voltage at the K2 input of axis 3

S8 reserved

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4. AD-Submodule



4.1 Analogue Inputs

Voltage Inputs Differential - 15 pin Sub-D female

Terminal	Signal	Description
1	Gnd	Power supply ground
2	IN1	Differential input 1/1
3	IN2	Differential input 2/1
4	IN3	Differential input 3/1
5	IN4	Differential input 4/1
6	IN5	Differential input 1/2
7	IN6	Differential input 2/2
8	IN7	Differential input 3/2
9	IN8	Differential input 4/2
10	nc	
11	+15V	Power supply 5mA
12	-15V	Power supply 5mA
13	Gnd	Power supply ground
14	nc	
15	nc	

Voltage Inputs Single Ended - 15 pin Sub-D female

Terminal	Signal	Description
1	Gnd	Power supply ground
2	IN1	Single Ended 1
3	IN2	Single Ended 2
4	IN3	Single Ended 3
5	IN4	Single Ended 4
6	IN5	Single Ended 5
7	IN6	Single Ended 6
8	IN7	Single Ended 7
9	IN8	Single Ended 8
10	nc	
11	+15V	Power supply 5mA
12	-15V	Power supply 5mA
13	Gnd	Power supply ground
14	nc	
15	nc	

Current Inputs Differential - 9 pin Sub-D female

Terminal	Signal	Description
1	Gnd	Power supply ground
2	IN1	Differential input 4/2
3	IN2	Differential input 3/2
4	IN3	Differential input 2/2
5	IN4	Differential input 1/2
6	IN5	Differential input 4/1
7	IN6	Differential input 3/1
8	IN7	Differential input 2/1
9	IN8	Differential input 1/1

Description to input numbering x/y

x/ => channel number

/y => Differential input line 1 or 2

Current Inputs Single Ended- 9 pin Sub-D female

Terminal	Signal	Description
1	Gnd	Power supply ground
6	IN4	Input 4, pin 2 to Gnd
7	IN3	Input 3, pin 3 to Gnd
8	IN2	Input 2, pin 4 to Gnd
9	IN1	Input 1, pin 5 to Gnd

5. DA-Submodule

Analogue Outputs - 15 pin Sub-D female

Terminal	Signal	Description
1	Gnd	Power supply ground
2	nc	
3	IOUT4	Current output 4
4	IOUT3	Current output 3
5	IOUT2	Current output 2
6	IOUT1	Current output 1
7	Gnd	Power supply ground
8	Gnd	Power supply ground
9	Gnd	Power supply ground
10	Gnd	Power supply ground
11	VOUT4	Voltage output 4
12	VOUT3	Voltage output 3
13	VOUT2	Voltage output 2
14	VOUT1	Voltage output 1
15	nc	