

Plug

X1

X2

X3

X4

X5

X6

X7

X8

X9

X10

X11/1

X11/2

X11/3

X11/4

X11/5

X11/6

X12/1

X12/2

X12/3

X12/4

X12/5

X12/6

X12/7

X12/8

X12/9

X12/10

X12/11

X12/12

X12/13

X12/14

X12/15

X12/16

X12/17

X12/18

X12/19

X12/20

X13/1
X13/2
X13/3
X13/4
X13/5
X13/6
X13/7
X13/8
X13/9
X13/10
X13/11
X13/12

X14/1
X14/2
X14/3
X14/4
X14/5
X14/6
X14/7
X14/8
X14/9
X14/10

X15/1
X15/2
X15/3
X15/4
X15/5
X15/6
X15/7
X15/8
X15/9
X15/10
X15/11
X15/12
X15/13
X15/14
X15/15
X15/16
X15/17
X15/18
X15/19
X15/20
X15/21
X15/22
X15/23
X15/24

X16/1

X16/2
X16/3
X16/4
X16/5
X16/6
X16/7
X16/8

X17/1
X17/2
X17/3
X17/4

X18/1
X18/2
X18/3
X18/4
X18/5
X18/6
X18/7
X18/8

X19/1
X19/2
X19/3
X19/4
X19/5
X19/6
X19/7
X19/8

X20/1
X20/2
X20/3
X20/4
X20/5
X20/6

X21/1
X21/2
X21/3
X21/4
X21/5
X21/6

X22/1



X2

X4

X3

X6

X5

X8

X7

X10

X9

Description Supplier

36V Battery

GND Battery

Load output 1 (+) => +36V disc brush rechts

Load output 1 (-) => GND disc brush rechts

Load output 2 (+) => +36V disc brush links

Load output 2 (-) => GND disc brush links

Load output 3 (+) => +36V suction turbine 1

Load output 3 (-) => GND suction turbine 1

Load output 4 (-) => +36V suction turbine 2

Load output 4 (-) => GND suction turbine 2

Output lifting element 1 => brush deck (+)

Output lifting element 1 => squeegee (+)

Output low unit => chemie (+)

Output lifting element 1 => brush deck (-)

Output lifting element 1 => squeegee (-)

Output low unit => chemie (-)

36V Low load output 1 (+) => water pump (+) PWM

36V Low load output 2 (+) => water recycling pump (+) PWM

36V Low load output 3 (+) => buzzer (+)

36V Low load output 4 (+) => LED beacon (+)

36V Low load output 5 (+) => LED working light (+)

36V Low load output 6 (+) => water valve (+) PWM

36V Low load output 7 (-) => recycling valve (+) PWM

36V Low load output 8 (+) => reserve 1 (+)

36V Low load output 9 (+) => reserve 2 (+)

36V Low load output 10 (+) => reserve 3 (+)

36V Low load output 1 (-) => water pump (-) PWM

36V Low load output 2 (-) => water recycling pump (-) PWM

36V Low load output 3 (-) => buzzer (-)

36V Low load output 4 (-) => LED beacon (-)

36V Low load output 5 (-) => LED working light (-)

36V Low load output 6 (-) => water valve (-) PWM

36V Low load output 7 (-) => recycling valve (-) PWM

36V Low load output 8 (-) => reserve 1 (-)

36V Low load output 9 (-) => reserve 2 (-)

36V Low load output 10 (-) => reserve 3 (-)

24V Low load output 1 (+) => reserve 1 (+)
24V Low load output 2 (+) => reserve 2 (+)
24V Low load output 3 (+) => reserve 3 (+)
Output relay 1 A => Output relay 1 (+)
Output relay 1 B => Output relay 1 NC
Output relay 1 C => Output relay 1 NO
24V Low load output 4 (-) => reserve 1 (-)
24V Low load output 5 (-) => reserve 2 (-)
24V Low load output 6 (-) => reserve 3 (-)
Output relay 2 A => Output relay 2 (+)
Output relay 2 B => Output relay 2 NO
Output relay 2 C => Output relay 2 NC

36V battery
36V switched for HS enabeling
5V output USB (+)
USB R1
5V output ex sensors (+)
Ground battery
USB shield
USB R2
5V output USB (-)
5V output ex sensors (-)

Analog input 1
Analog input 2
Analog input 3 => fresh water empty
Analog input 4 => waste water full
Analog input 5 => Position LE brushdeck
Analog input 6 => seat occupancy 1 (NC)
Analog input 7 => seat occupancy 2 (NO)
Analog input 8 => Position LE sweeper attachment
Analog input 9 => temperature side broom l.h. / r.h.
Analog input 10 => temperature broom
Analog input 11 => temperatur brush r.h.
Analog input 12 => temperatur brush l.h.
GND Analog input 1
GND Analog input 2
GND Analog input 3 => fresh water empty GND
GND analog input 4 => waste water full GND
GND analog input 5 => Position LE brushdeck GND
GND analog input 6 => seat occupancy 1 (NC) GND
GND analog input 7 => seat occupancy 2 (NO) GND
GND analog input 8 => Position LE sweeper attachment GND
GND analog input 9 => temperature side broom l.h. / r.h. GND
GND analog input 10 => temperature broom GND
GND analog input 11 => temperatur brush r.h. GND
GND analog input 12 => temperatur brush l.h. GND

Opto input 1 (+) => reserve 1 (fast)

Opto input 2 (+) => reserve 2 (fast)
Opto input 3 (+) => reserve 1 MKSE
Opto input 4 (+) => reserve 2 MKSE
GND Opto input 1 => reserve 1 GND
GND Opto input 2 => reserve 2 GND
GND Opto input 3 => reserve 1 MKSE GND
GND Opto input 4 => reserve 2 MKSE GND

CAN0 high
DGND
CAN0 low
VGND

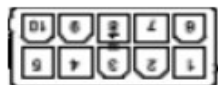
CAN1 high
CAN1 GND
CAN2 high
CAN2 GND
CAN1 low
VGND
CAN2 low
VGND

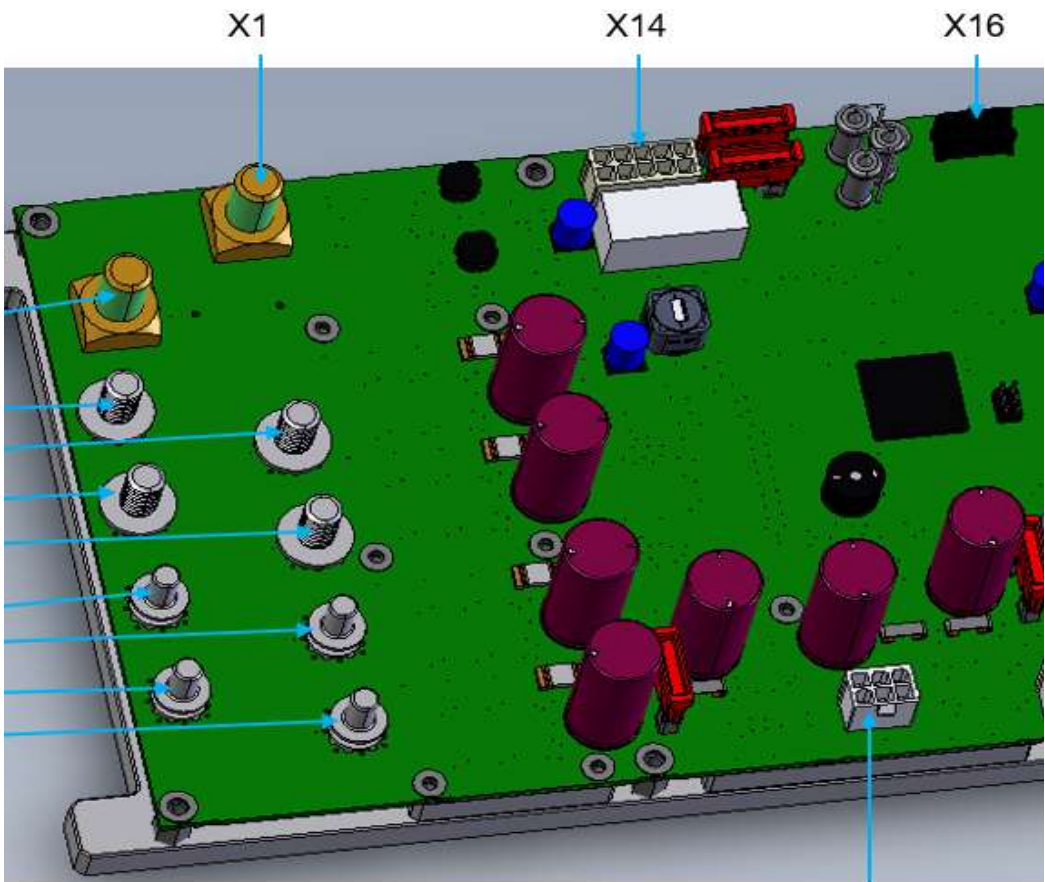
control panel VGND
control panel HaBu GND
control panel HaBu GND
control panel HaBu_Low
control panel HaBu_High
control panel HaBu_+5V
control panel HaBu_+5V
control panel VGND

not used
Diag. GND_DIG
Diag. AcDiEn
Diag. TX_Diag_Out (isolated)
Diag. RX_Diag_In (isolated)
not used

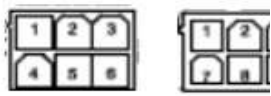
JTMS
3,3V
JTCK
JTDO
Reset
GND

ESD-Dissipation





X11



Description Hako-Controller

Load pin +36 V

Load pin GND

Brush motor l.h. (M3) 36V

Brush motor l.h. (M3) GND

Brush motor r.h. (M4) 36V

Brush motor r.h. (M4) GND

Suction turbine 1 (M16) 36V

Suction turbine 1 (M16) GND

Suction turbine 2 (M17) 36V

Suction turbine 2 (M17) GND

Lifting element brush deck (+) (M9) 24V

Lifting element squeegee (+) (M10) 24V

Fan motor suction sweeping (+) (M25) 36V

Lifting element brush deck (-) (M9)

Lifting element squeegee (-) (M10)

Fan motor suction sweeping (-) (M25)

Water pump (+) PWM (M8) max. 24V

not connected

Reserve X80

LED Beacon/flashlight (+) (E2/20/21) 36V

LED Working light (+) front (E1/11) 36V

Water valve (+) PWM (Y1) max. 24V

Valve water recycling (+) PWM (Y3) max. 24V

Relay high pressure cleaner ON (+) (K29) 36V

not connected

BlueSpot front (+) (E14/17) 36V

Water pump (-) PWM (M8) max 36V

not connected

Reserve X80

LED Beacon/flashlight (-) (E2/20/21)

LED Working light (-) front (E1/11)

Water valve (-) PWM (Y1)

Valve water recycling (-) PWM (Y3)

Relay high pressure cleaner ON (-) (K29)

not connected

BlueSpot front (-) (E14/17)

Lifting element brush deck supply (+) (M9) 24V
Buzzer reverse drive / acoustic signal (+) (P2) 24V
LED, High pressure cleaner ON (+)
not connected
not connected
not connected
(Position) Lifting element brush deck (-) (M9)
Buzzer reverse drive (-)
LED, High pressure cleaner ON (-)
Travel O.K. (-)
Travel O.K. (Normally Open)
not connected

Key switch +36V
36V Main relay 1 (Master is switching also for Slave)
5V USB
USB R1
5V external sensor (pressure-/flow fresh water)
GND
not connected
USB R2
USB GND
not connected

Fresh water empty (B4) 0-6V
Flow meter fresh water (B18) 5V / 25Hz
Position lifting element brush deck
Seat occupancy 1 (Normally Close)
Seat occupancy 2 (Normally Open)
not connected
Temperature pompe high pressure cleaner
Push button, high pressure cleaner ON (S29) => to A01/8
Temperature brush motor l.h. (M3)
Temperature brush motor r.h. (M4)
not connected
not connected
Fresh water empty GND
Flow meter fresh water GND
Lifting element brush deck GND together with X13/7
Seat occupancy 1 (Normally Close) GND
Seat occupancy 2 (Normally Open) GND
not connected
Temperature pompe high pressure cleaner GND
Push button, high pressure cleaner ON (S29) GND
Temperature brush motor l.h. GND
Temperature brush motor r.h. GND

not connected

not connected
Steering controller state LED
not connected
not connected
not connected
Steering controller state LED GND

not connected
not connected
not connected
not connected

CAN1 high control panel / diagnose / chemical pump / optional modules
DGND "control panel"
CAN2 high "Drive controllers"

CAN1 low high control panel / diagnose / chemical pump / optional modules

CAN2 low "Drive controllers"

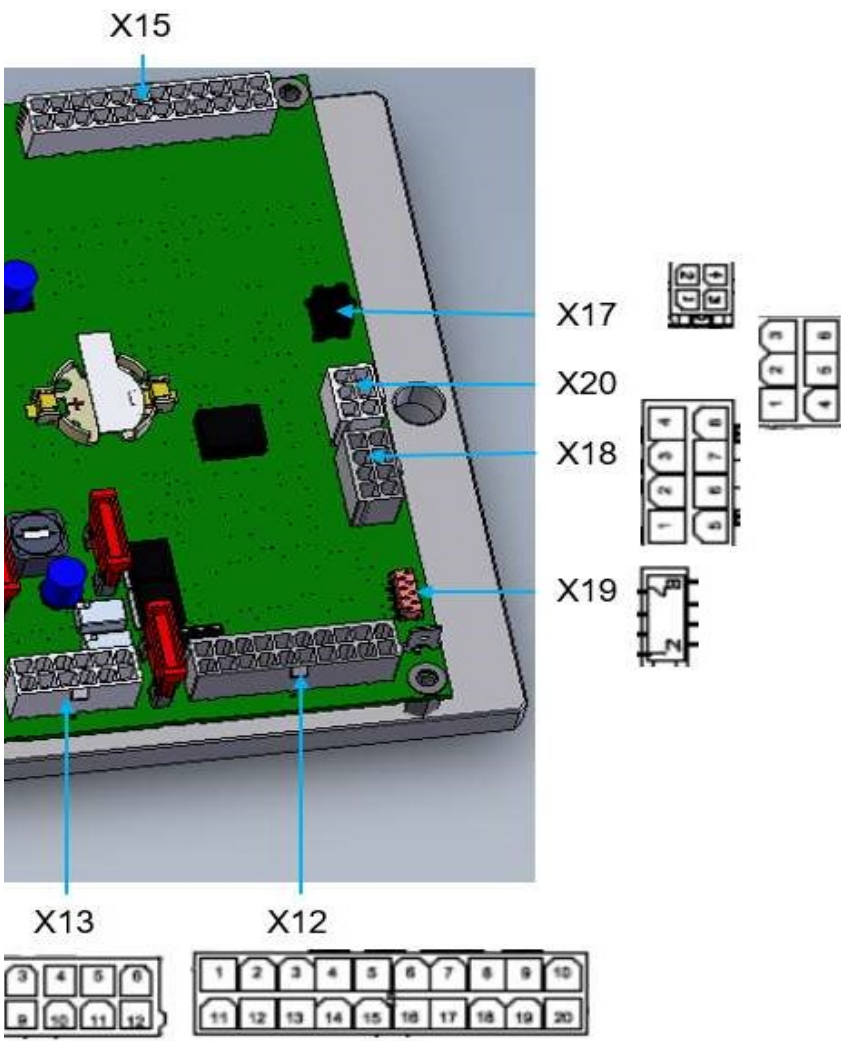
not shown
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not shown
not shown
not shown
not shown
not shown
not shown

not connected
Fleet / Diagnose connection GND
not connected
Fleet / Diagnose connection TX
Fleet / Diagnose connection RX
not connected

not connected
not connected
not connected
not connected
not connected
not connected

VGND contrary electronic board





Remark

clocked signal
clocked signal

with idleness detection

Output ON, if ELCOS charged

Analog input 0-40V / 10kHz

Analog input 0-6V / 10kHz

Digital input 5V internal contrary GND

Analog input 0-6V / 10kHz

Digital input 5V internal contrary GND

Digital input contrary 5V from external

Digital input 5V internal contrary GND

Digital input 5V internal contrary GND

Digital input 5V internal contrary GND

Digital input 5V internal contrary GND