



ELAM SENSOR/ ACTUATOR CONNECTIONS

With the ELAM system for better integration of sensor and actuators.



Compact SWA workplace computer from Armbruster Engineering. Further models are available

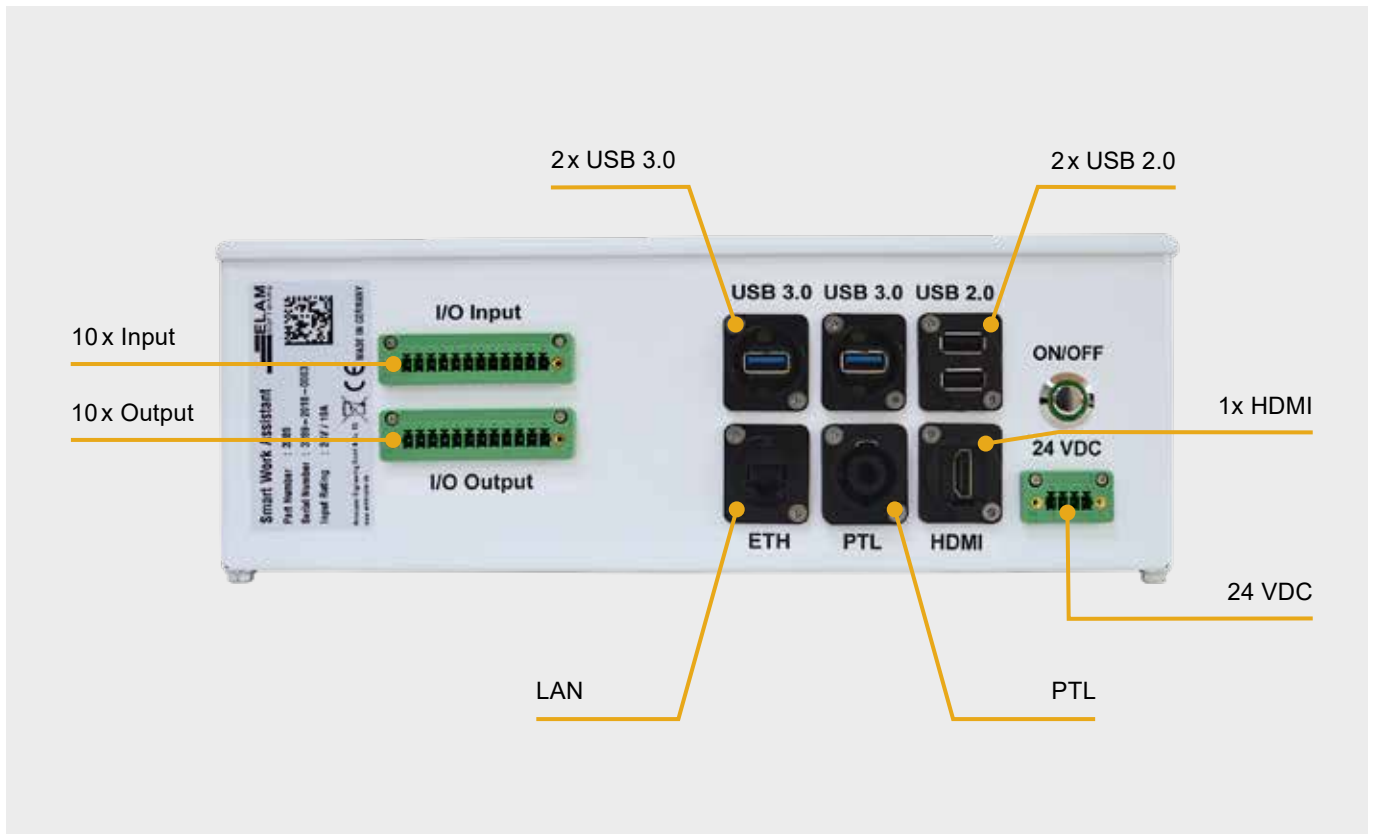
SENSOR / ACTUATOR CONNECTION

The use of assistance systems has become increasingly common in many industrial workplaces. Assistance systems show visualisations to employees that are shown on their work station computers. These are recalled by scanning an order via a start form or directly through the interface with an ERP system. After this, the supporting interactive process of visualisation is shown step by step.

These interactive work instructions, providing a high level of support to the employee, require information from the work environment, alongside visual specifications, in order to properly issue control signals to tools, sensors and pick to light devices. The connection of scanners is relatively easy, but not that of **sensors and actuators, as described here.**

Earlier, when there were only few interfaces with computers, it was an obvious step to include a programmable logic controller (PLC) upstream of the workplace computer to gather and process these signals. The consequence of this, however, was that a separate PLC program needed to be created in order, on the one hand, to send the pending signals to the workplace computer and, on the other, to request the reactions to be issued by the workplace computer from the periphery, such as evaluate, stop, rework etc. Such PLC programs are laborious, expensive and must be subject to all the changes taking place at such workplaces. It has turned out to be more efficient to leave out the SPS and provide the workplace computer itself with all the interfaces needed to control the periphery directly via the visualisation process.

Only in such cases, where many, rapid (defined cycle times must report their exactitude) and safety-relevant connections are needed is it still appropriate to insert a PLC before the workplace computer. In all other cases, when our components are used, a PLC is no longer required, and sensors and actuators can be controlled via the interfaces. **We have achieved this with the SWA.**



Interfaces of the SWA workplace computer

THE SWA

The visualisation by the client can be carried out via an integrated display or external monitor. To process signals, the SWA has 10 x digital inputs and 10 x outputs, directly available via a terminal box.

Typical operations with sensor signals include component queries, integrated in an assembly fixture and checking the use of the right component variant. This avoids incorrect assembly.

If automated steps are used, the confirmation of a work step can be triggered more conveniently by a sensor signal.

A further reaction to incoming sensor signals could be triggering a branching step in the process sequence, immediately initiating an alternative process. This is used very often in repair visualisations.

Common actuators controlled via outputs in the workplace are clamping cylinders, magnetic valves or control devices. Program activation for robots, screwing systems or test devices is also frequently required.

To be able to fulfil these tasks, we have developed a device toolbox allowing simple interconnections with as little wiring as possible. Alongside the SWA, this toolbox is based at its core on a high-performance power unit for 24 V supply. The power unit has an input of 100 – 240 V at 4.0 A 50 / 60 HZ; and an output of 24 V at max. 10 A direct current.

If several devices are supplied with 24 V, this can be carried out using a distribution box that can supply up to 3 locations via plug connections.

SWA POWER SUPPLY – 5520 / 5521 / 3585



Legend:

- 01 SWA Power Supply (STAMA No. 5520)
- 02 SWA Connection Cable (STAMA No. 5521)

- 03 Distribution box (STAMA No. 3585)
- 04 Application example

TECHNICAL DETAILS

SWA POWER SUPPLY MEAN WELL HLG-240H-24A (STAMA No. 5520)

Output voltage	24 VDC	
Output current	10A	
Output power	240 W	High level of efficiency, up to 96 %
Input voltage range	100 – 240 VAC bei 50/60 HZ	Fanless
Dimensions (W x H x D)	244,2 mm x 38,8 mm x 68 mm	
Weight	1,24 kg	

SWA CONNECTION CABLE (STAMA NO. 5521)

Cable length	1,5 mm	
Weight	0,2 kg	
Compatible with:	SWA (3286/3287) (3288/3289) Sensor box (3580) clamp box (3575)	

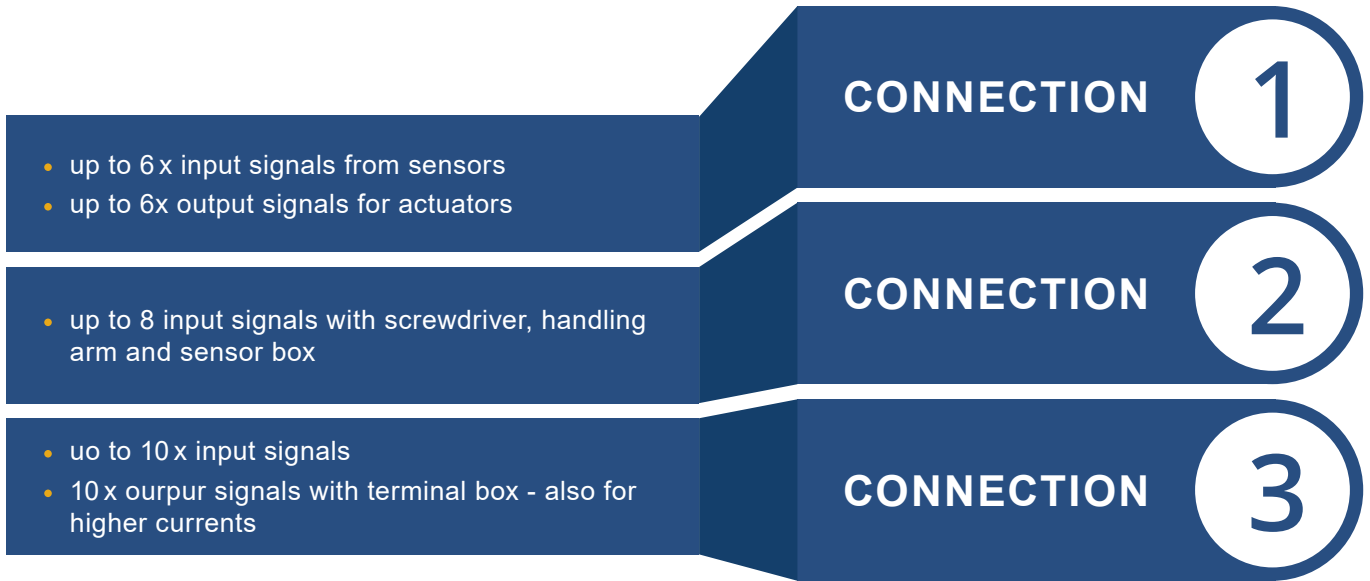
DISTRIBUTION BOX (STAMA Nr. 3585)

Inputs (number)	1	
Outputs (number)	3	Solid housing
Dimensions (W x H x D)	150 mm x 60 mm x 100 mm	Allows an easy connection of several devices with 24 VDC voltage supply
Weight	100 – 240 VAC bei 50/60 HZ	
Compatible:	SWA power unit(5520), SWA Connection Cable (5521)	

SOFTWARE TOOLS (STAMA Nr. 3933)

STAMA No. 5520	24 VDC switching
STAMA No. 5521	SWA Standard connection cable, 1,5 m Länge
STAMA No. 3585	Distribution box

WE DISTINGUISH BETWEEN **THREE CONNECTION OPTIONS** FOR SENSORS AND ACTUATORS, ALL DISTINGUISHED BY THEIR GALVANIC ISOLATION:



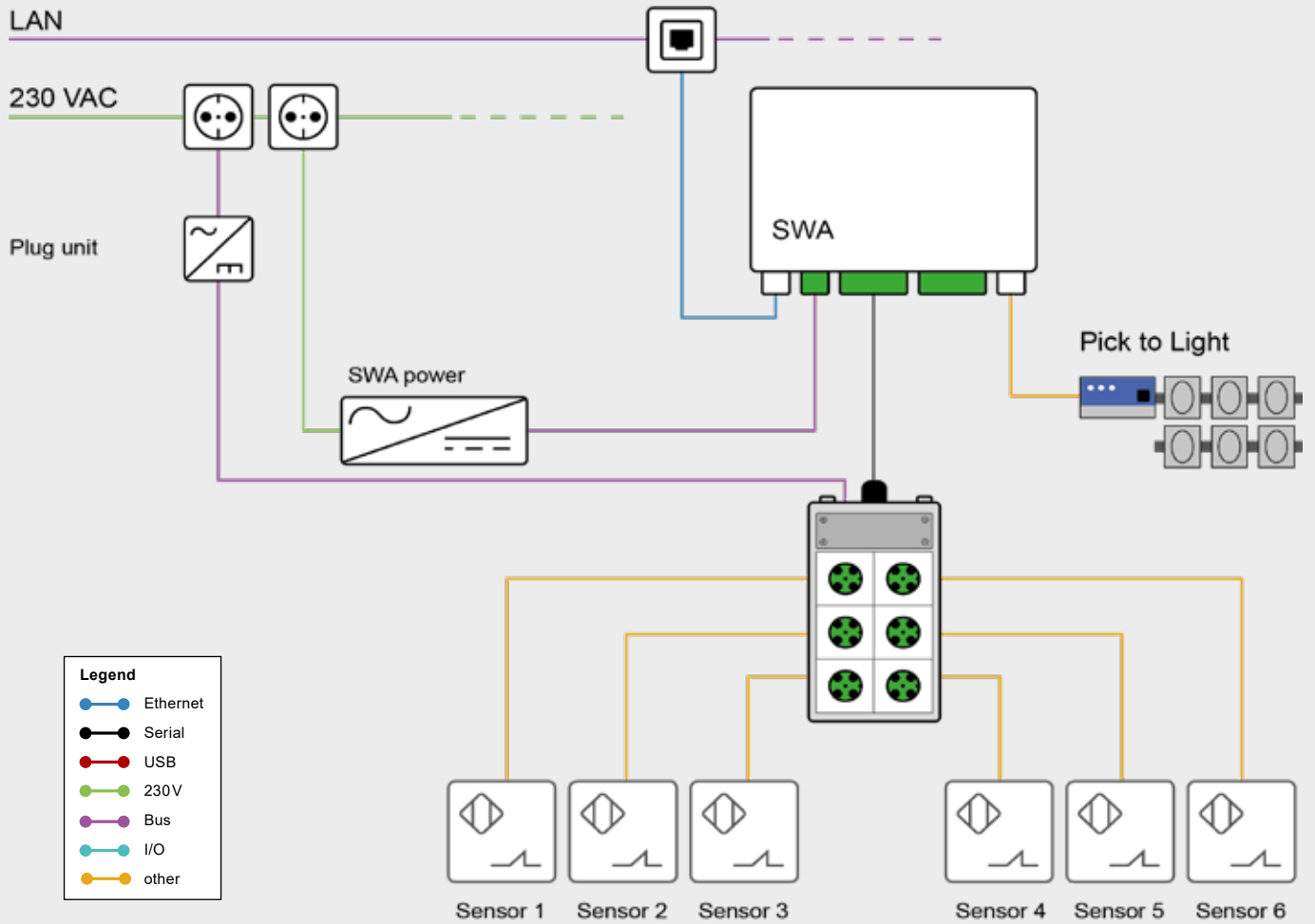
01 SENSOR BLOCK UP TO 6 INPUT SIGNALS FROM SENSORS AND UP TO 6 OUTPUT SIGNALS FOR ACTUATORS

if only a few sensor signals are processed as input signals – e.g. as contactless sensors to query assembly fixtures or clamping systems, we recommend the use of a sensor block.

The sensors are directly attached to the sensor block with M12 plugs whose output cables fit the input plugs of the SWA and are screwed on there. The block is supplied with power externally via a plugged in power unit.



We supply it as a block of 6 or 10 connections. With 2x 10 connections, the maximum limit of this solution is achieved. The two following configurations show the extensions.



Sensor block for up to 6 Sensors, connected to the SWA with power supply



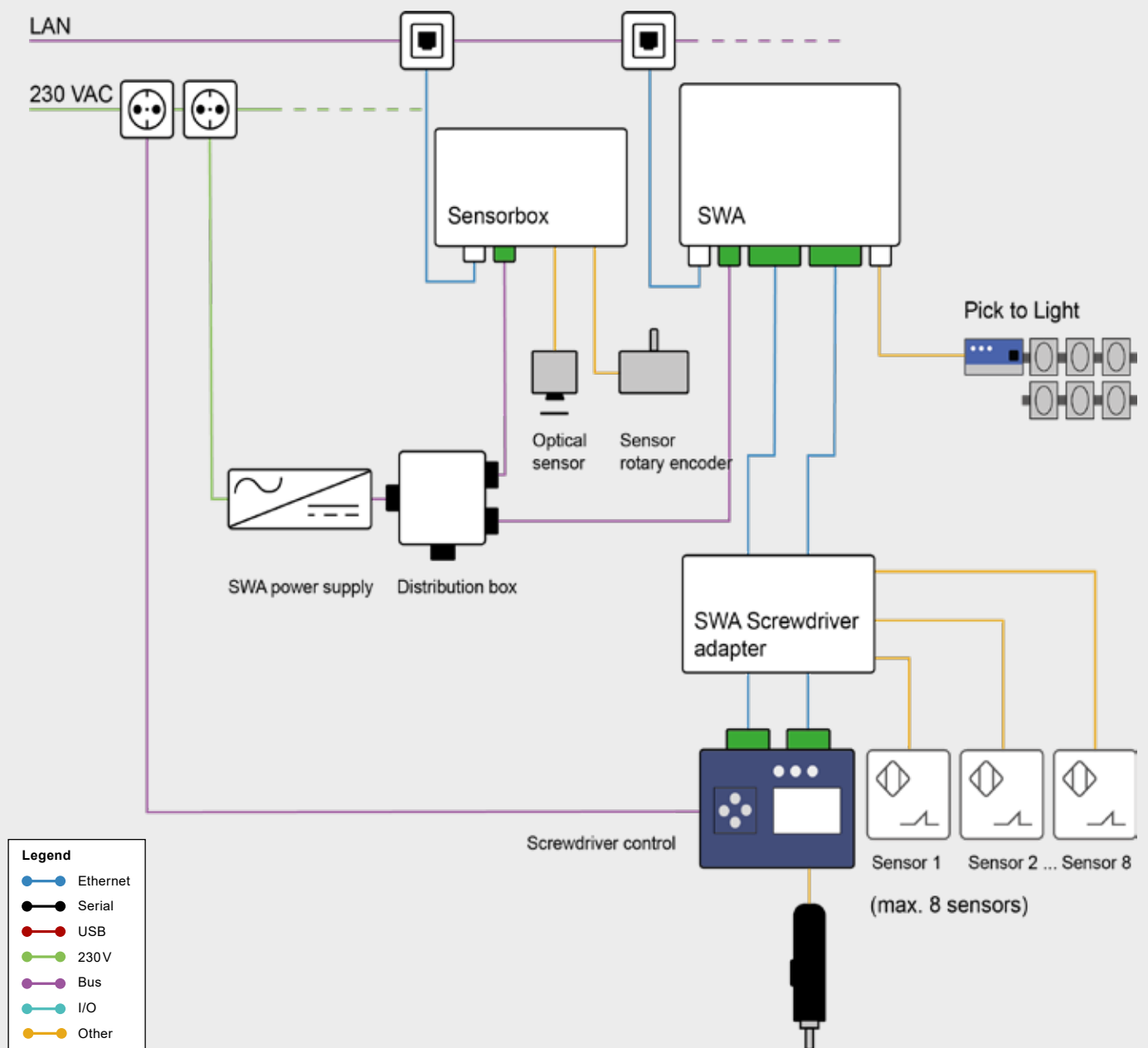
Our new equipment simply processes signals by identifying them and including them in the intended process sequence. Via our flowchart, measurement results can be interpreted and the process adapted dynamically to it.

02 SOLUTION FOR UP TO 8 INPUT SIGNALS WITH SCREWDRIVER, HANDLING ARM AND SENSOR BOX

Though electrically controlled screwdrivers offer value for money and are often satisfactory for assembly, they need many switching signals for control and fully occupy the 10 x input and 10 x output signals of the SWA.

If on top sensor signals need to be processed, something which is usually the case, a new solution is required. For this reason, in the SWA toolbox there is a screwdriver adaptor which can handle the controls of screwdrivers and also take in and process up to 8 additional sensor signals. This offers great value for money in screwing stations, as on the one hand, the laborious and error-prone wiring is now unnecessary, and on the other, up to 8 input signals can be processed.

If an additional handling arm or further sensors need to be attached in, the sensor box simply needs to be extended.





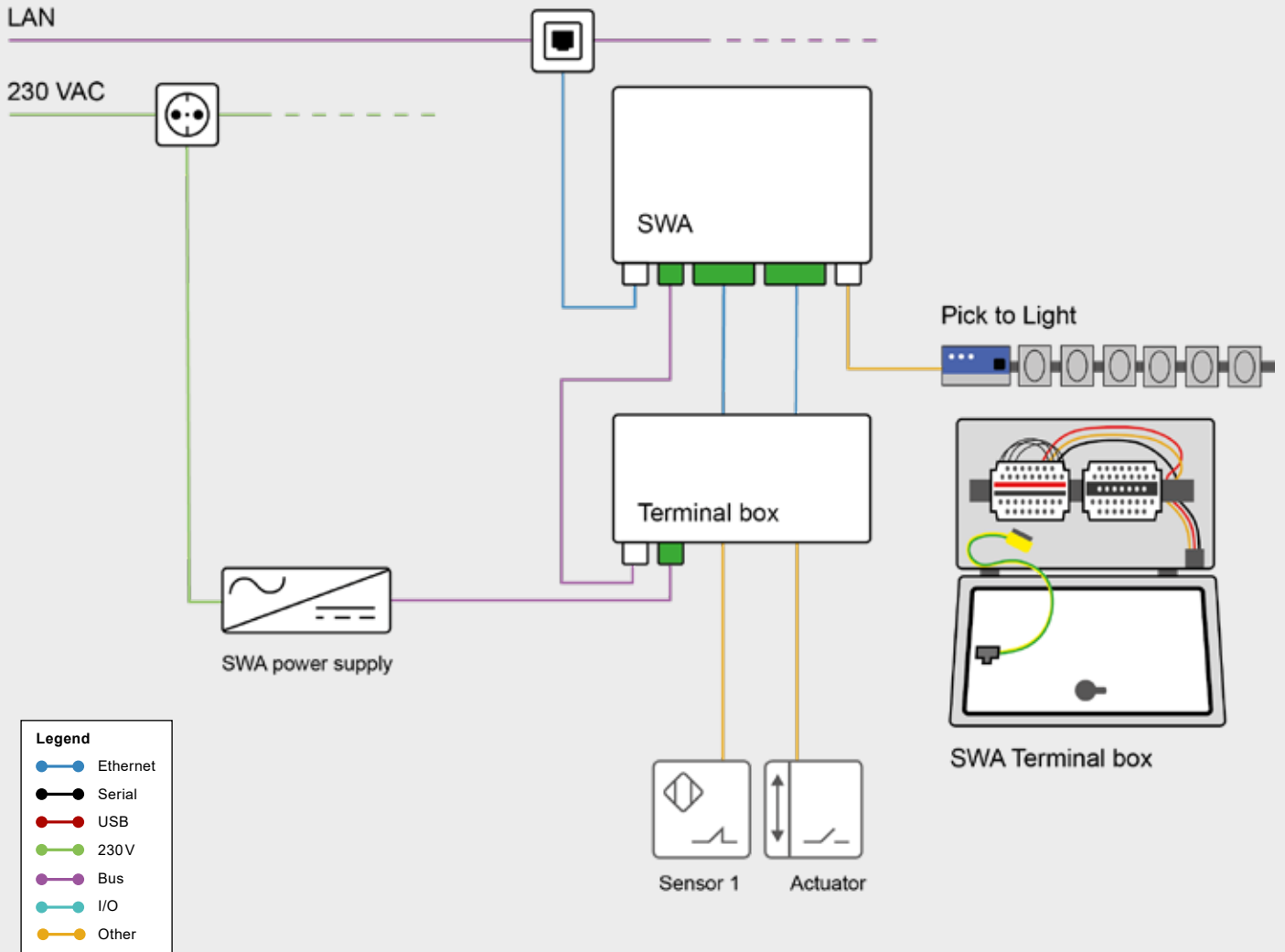
Screwdriver with sensor connection



The 24-V supply is proved by the distribution box to the sensor box for control of a positioning arm, to the SWA and the screwdriver adapter. No additional external supply is required.

03 SOLUTION FOR UP TO 10 INPUT AND OUTPUT SIGNAL WITH TERMINAL BOX - ALSO FOR HIGHER CURRENTS

If several sensors and actuators need to be connected to a work station, we use a terminal box to help with the wiring. The input and output cables from and to the terminal box are attached using a terminal strip, meaning no PG screw connections are needed and the cables can be easily changed. The outputs can handle up to 500 mA.





Arrangement of the terminal box with SWA and power unit

Let it be noted here that pick to light displays do not count for us as sensor signals, as they are controlled directly in the SWA via a bus system plug. In this way, up to 60 pick to light displays can be connected to an SWA and thus for each work station.

After the hardware is set up, the work process at the station can be visualised. The visualisation software ELAM, shown on the SWA, is able to read in the required sensor signals for each work step, process them, react immediately and do the further processing. The visualisation editor has an interaction level to connect the work process with the periphery without a separate program being needed for this. In this way, the work process with integrated signal processing can take place without a program needing to be coded.

The solutions presented are, as a whole, simple and very economical.

PACKAGES & PRICES

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|----------|---|----------------|
| 1 | Sensor block, bis zu 6x Input signals from sensors and up to 6x output signals for actuators | € 250,- |
| 2 | Up to 8 input signals with screwdriver, handling arm and sensor box | € 365,- |
| 3 | Up to 10x input signals and 10x output signals with terminal box – even for higher currents | € 695,- |
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Package prices net ex works Bremen, not incl. VAT and shipping..

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