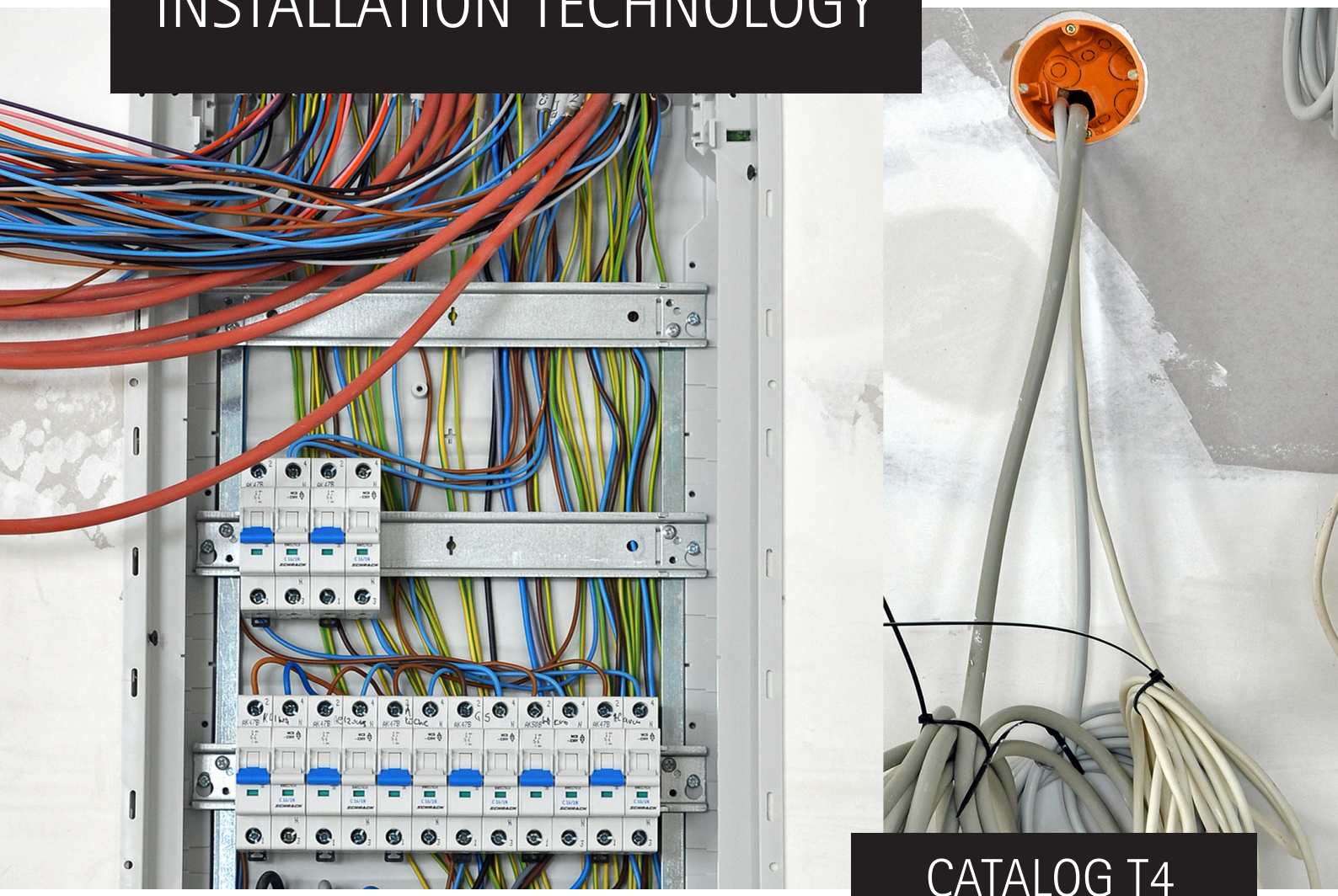
PHYSICS

CHEMISTRY
BIOLOGY

ENGINEERING

LD DIDACTIC

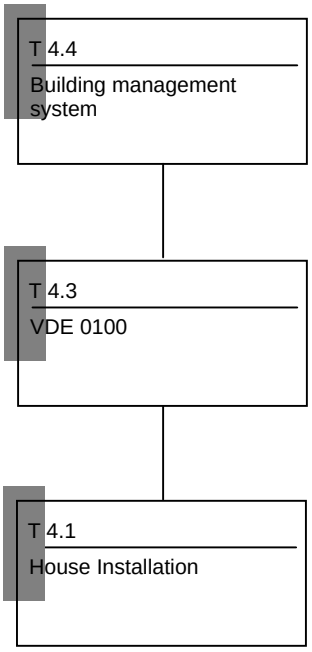
INSTALLATION TECHNOLOGY



CATALOG T4

LEYBOLD®

Content


T 4.4
Building management system
T 4.3
VDE 0100
T 4.1
House Installation

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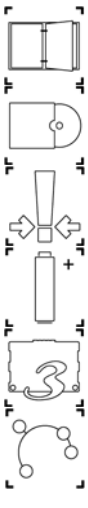
Symbols and abbreviations used in this catalogue:



Experiment manuals contained

Software contained

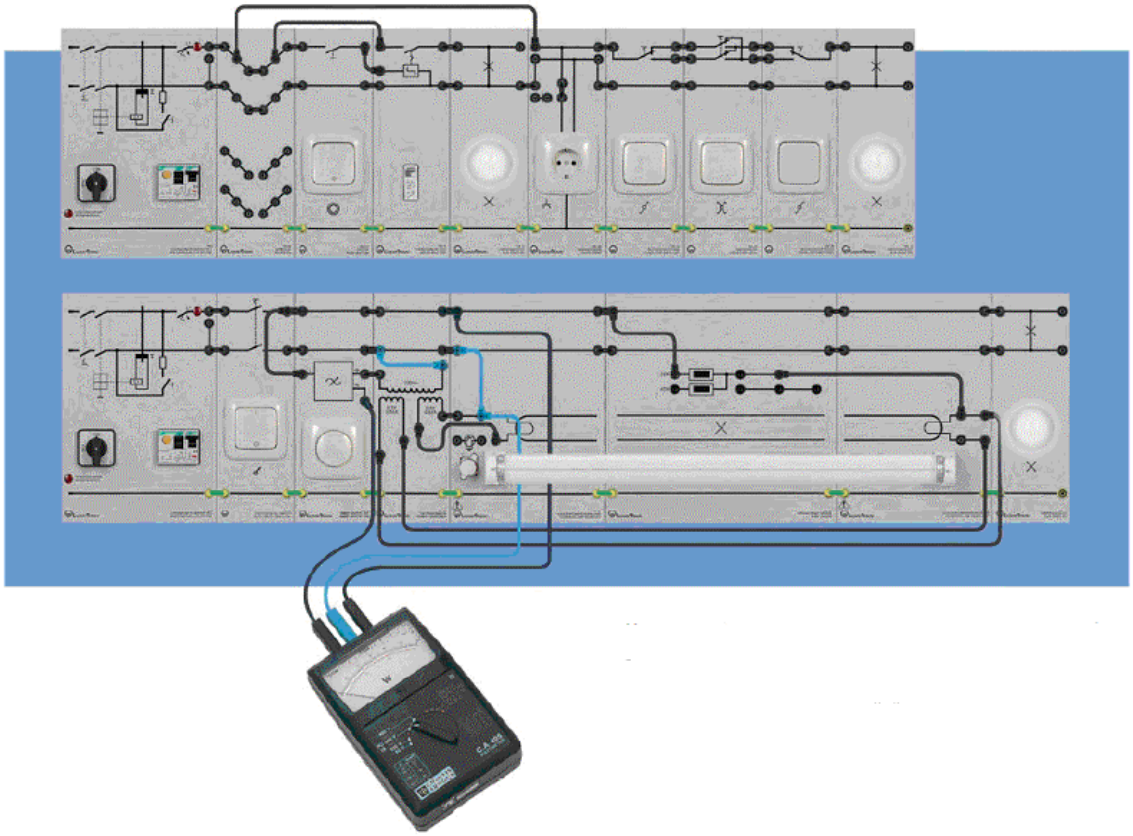
Accessory required

Battery required

Compatible to COM3LAB

USB support

T 4.1.1.1 Lamps and appliance circuits

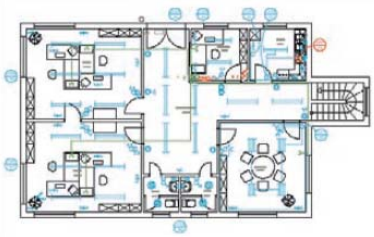


Topics

- Standard installation circuits
- Switches and pushbuttons
- Impulse relay and staircase circuits
- Dimmer
- Fluorescent lamps

T 4.1.1.1 Lamps and appliance circuits

LD Didactic Electrical Installation: an alternative to workshop classes!



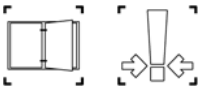
This set deals with standard installation circuits for all general service lamps and fluorescent lamps in conjunction with our training panel system. This requires no tools so the trainee can concentrate entirely on putting his accrued knowledge into practice. Particular emphasis is placed on adherence to the applicable regulations governing electrical installations. Safety sockets and cables guarantee optimal low-voltage range protection against personal injury during the experiments. Protection against personal injury during the experiments.

EQUIPMENT LIST T 4.1.1.1

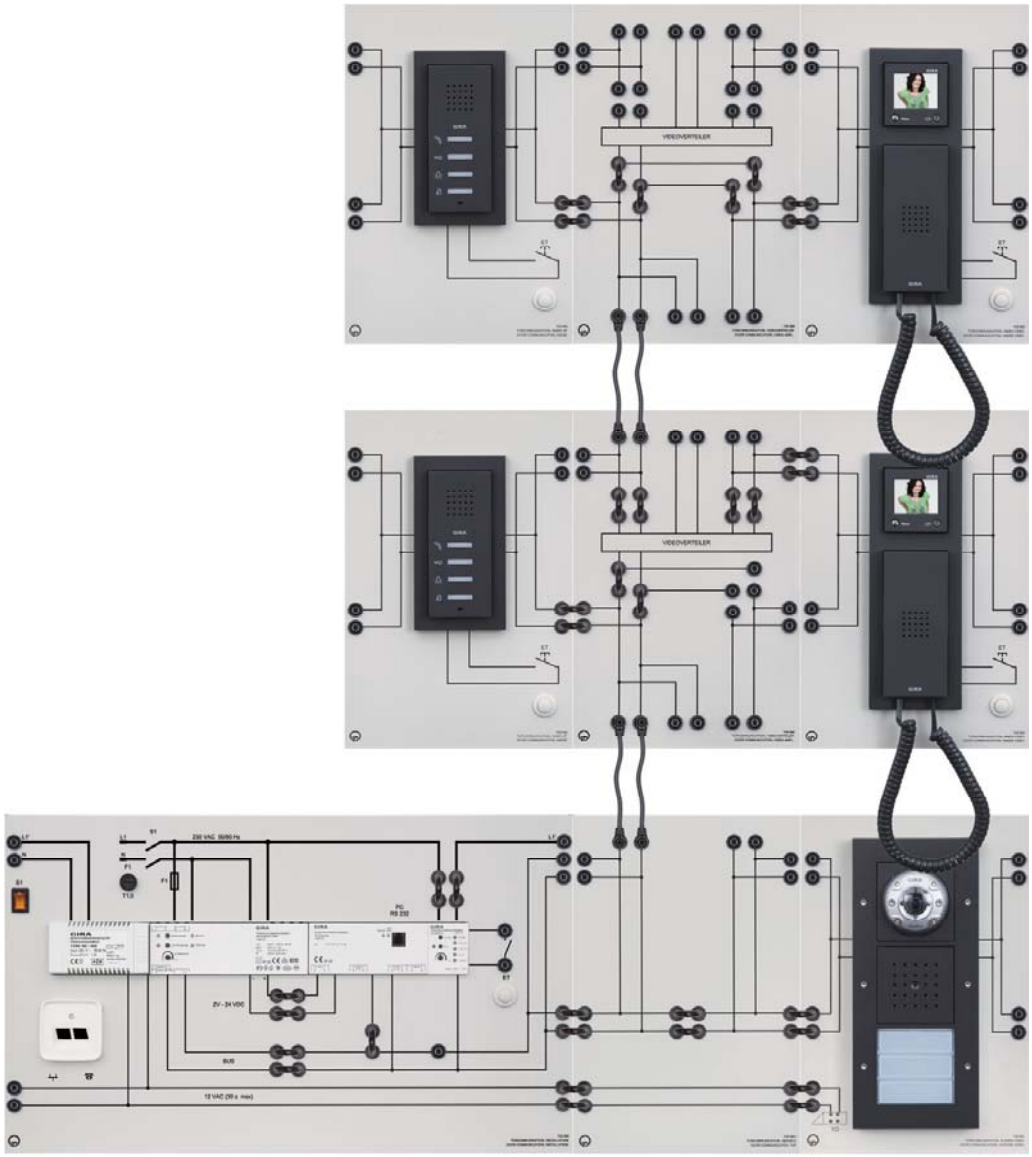
Lamp and Appliance Circuits

Quantity	Cat.-no	Description
1	729 01	On/Off Switch, Double Pole
1	729 02	On/Off Switch, Single Pole
1	729 03	Multiple Switch
1	729 04	Change-Over Switch Left
1	729 05	Cross-Over Switch
1	729 061	Schuko Socket
2	729 07	Pushbutton
1	729 08	Junction Box
1	729 10	Impulse Relay 230 V
1	729 12	Automatic Staircase Switch
1	729 13	Lamp Socket E27
2	729 14	Fluorescent Lamp Socket, Left
2	729 15	Fluorescent Lamp Socket, Right
1	729 16	Spacing Panel
1	729 18	Choke 20 W/40 W
1	729 21	Dimmer Inductive Load
1	729 22	Filament Transformer
1	729 23	Automatic Circuit Breaker 10 A
1	729 25	Lamp Socket E27 Series
1	729 26	Change-Over Switch Right
1	729 41	Capacitive Load 0.3
2	505 301	Incandescent lamp 230 V/60 W
1	566 302	Book: Lamp and Appliance Circuits

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.



T 4.1.4.4 Door Communications systems



Topics (selection)

- Planning of door communication – topologies, wiring
- Planning of door communication – loop-through solution
- Planning of door communication – stub-line solution
- One-man commissioning – 3-family house with switch actuator

T 4.1.4.4 Door Communications systems

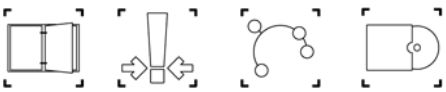
Door communication systems consist of central processing units, home units and the door unit. The modular architecture allows you to choose between the options "only audio" and "audio plus video". Of course, both types can be combined and operated centrally. Through an integrated telecommunications gateway it is possible to connect to the telephone network. Through the use of advanced digital two-wire bus technology, highest audio and video quality is ensured. The system can be expanded up to eight home stations and two door stations.

EQUIPMENT LIST T 4.1.4.4

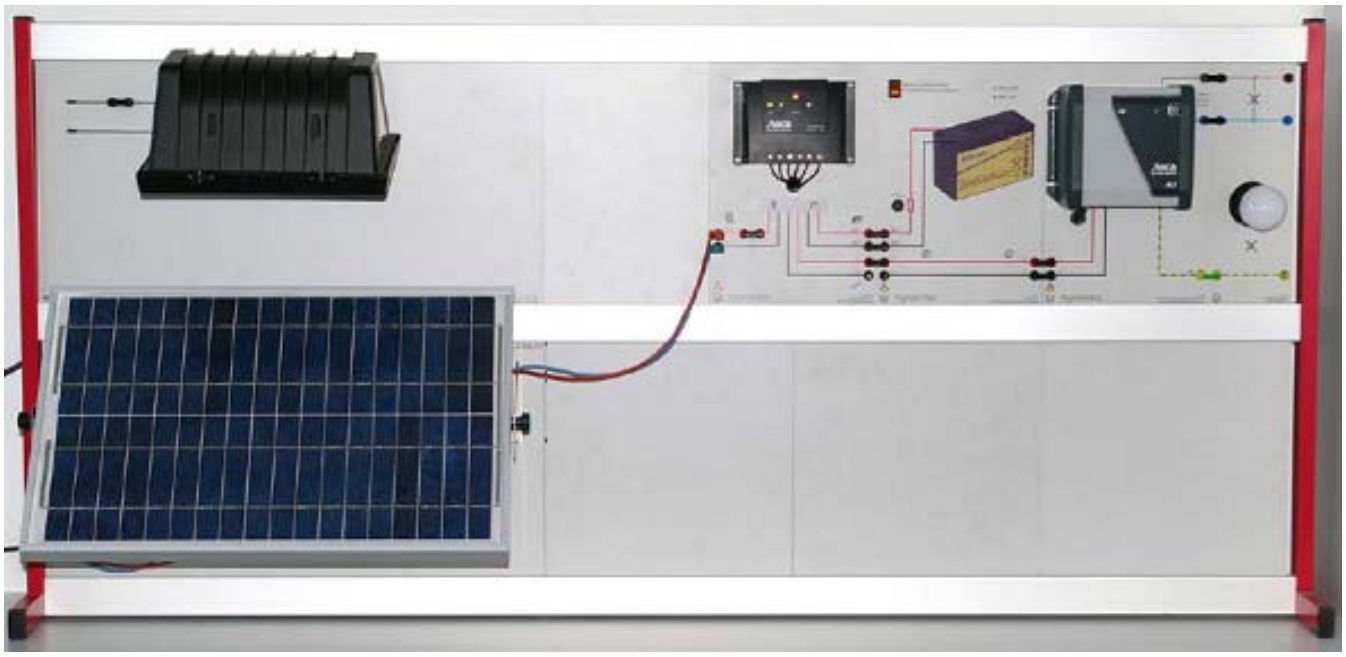
Door Communications systems

Quantity	Cat.-no	Description
1	729 580	Door communication, installation
1	729 5801	Door communication
1	729 581	Door communication, outside
2	729 582	Door communication, inside
2	729 583	Door communication, inside video
2	729 584	Door communication, video ampl.
1	729 596	Door opener
1	729 585	Door communication, outside audio

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.



T 4.1.6 Photovoltaic Systems



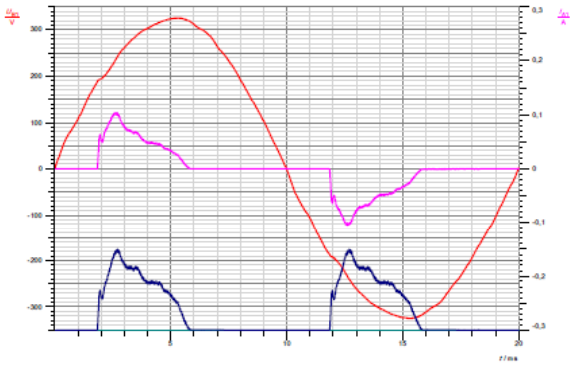
Topics (selection)

- ➔ Producing electricity with solar modules
- ➔ Maximizing solar performance by optimum inclination
- ➔ Optimum location, shading
- ➔ Storage of electrical energy
- ➔ Measurements on converters
- ➔ Power measurement on AC consumers

T 4.1.6 Photovoltaic Systems

The importance of environmentally-friendly technology is increasing in the coming years. This trend is also reflected in the portfolio of LD Didactic. Therefore, the TPS photovoltaic device training system comprises a further component within our Greentec facilities. The new facilities use customary solar components in an educational format and gives realistic results, thus creating the optimal connection between theory and practice.

The topics include the generation of power in the solar modules, the storage of the power generated and the handling of AC consumers using an inverter. Using Sensor CASSY 2 and the CASSY-Lab Software the experiments produce graphical results that are easy to interpret.



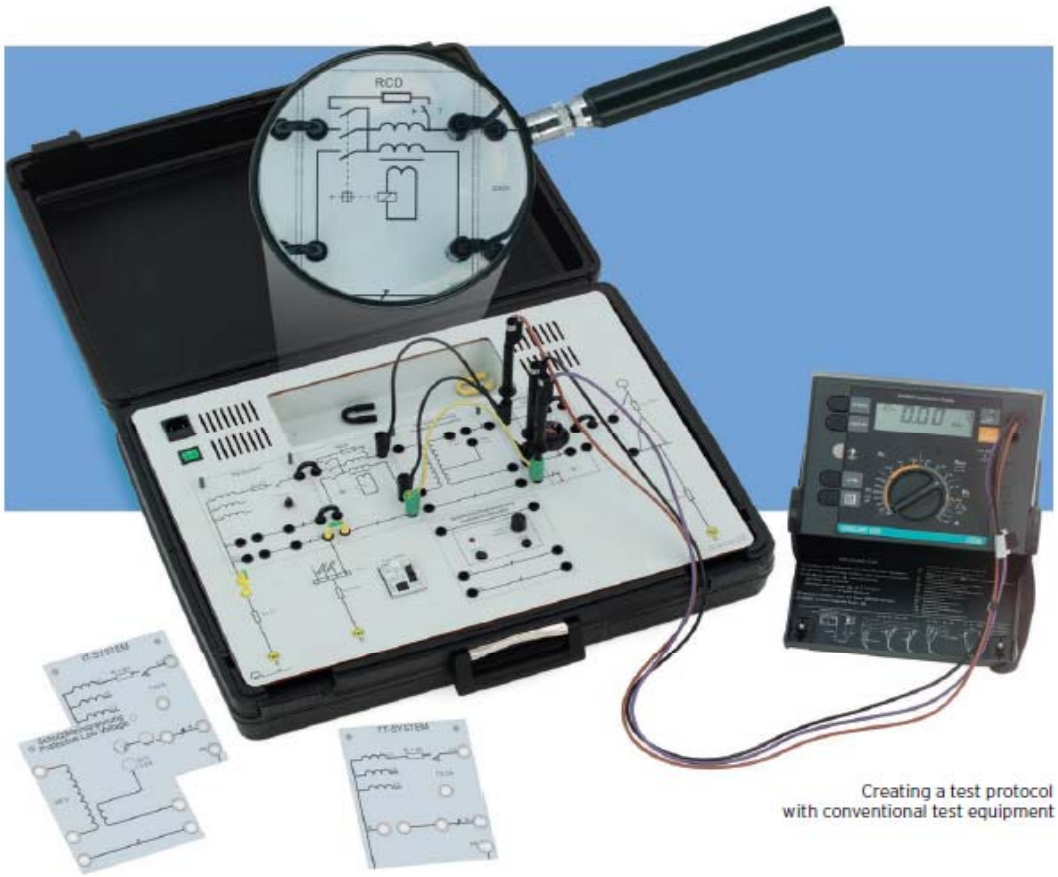
EQUIPMENT LIST T 4.1.6

Photovoltaic Systems

Quantity	Cat.-no	Description
1	729 13	Lamp Socket E27
1	729 5011	Accumulator for solar system
1	729 502	Solar Converter (isolated operation)
1	729 5031	Solar panel with lamp
1	729 5051	Solar Charge Controller

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.

T 4.3.3 Trainer Artificial Mains Network



Creating a test protocol
with conventional test equipment

Topics

- Protective measures appropriate to almost all types of line power systems (e.g. IT, TT, TN) can be realized by simply changing jumper connections
- Simulation of an installation with all protective measures and a grounding line per VDE 011 Part 410
- All practical measurements can be performed directly on the line power with conventional DIN/VDE 0413 test instruments. Measurements for grounding and potential difference equalization can also be carried out.
- Protecting against direct and indirect contact

T 4.3.3 Trainer Artificial Mains Network

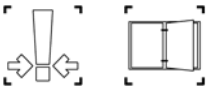
The complete system, 729 865 Protection circuits VDE 0100, serves as an ideal exercise unit for protective measures against hazardous shock currents in conformance with VDE 0100, Part 410. For any learning situation, whether it be for the vocational training of skilled workers or master craftsmen or even as a demonstration unit for theoretically taught material, this system‘s flexible usage offers the appropriate solution.

EQUIPMENT LIST T 4.3.3

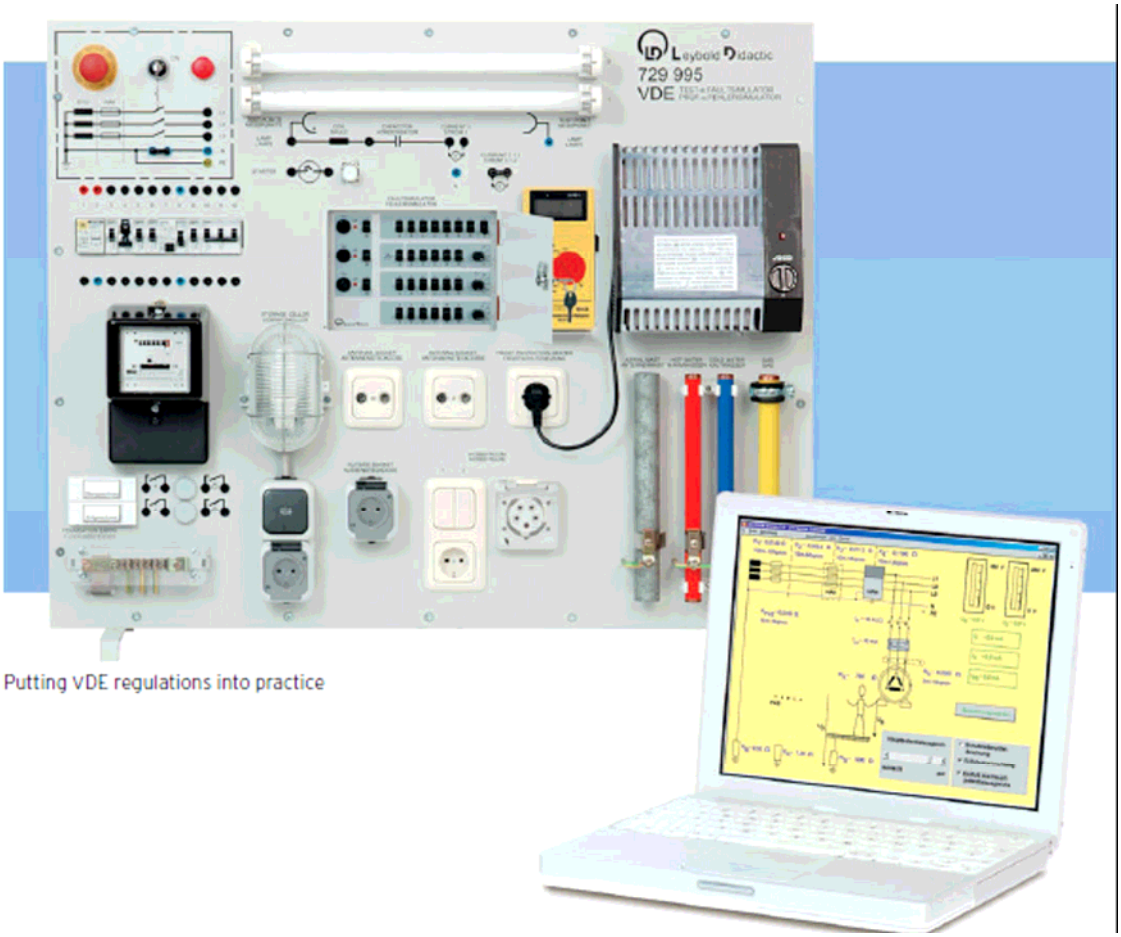
Trainer Artificial Mains Network

Quantity	Cat.-no	Description
1	729 865	Experimental suitcase protection circuits VDE0100
1	566 395EN	Book: Protection against electric blow

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.



T 4.3.4 Test and Fault Simulator VDE



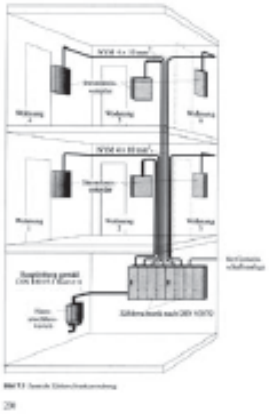
Putting VDE regulations into practice

Topics

- Power measurements with a power meter
- Equipotential bonding of telemetry equipment
- Circuit tests and troubleshooting with fault current circuit breaker
- Performing measurements according to VDE 0100/Part 610 and VDE 0701
- Creating a VDE approved test protocol

T 4.3.4 Test and Fault Simulator VDE

The LD Didactic training system „ Test and Fault Simulator VDE „, cat. no. 729 995, is a compact simulator of typical building electrical systems with various circuits, AC line network, three-phase line network and a complete building junction box. Electrical components for line voltage and signal transmission, loads, meters, and equipotential bonding equipment round out the system. The built-in fault simulator (which can be locked shut) can produce specific fault conditions.



The universal nature of this line model makes it applicable to diverse applications so that its classroom use spans the first three years of apprenticeship training. By carrying out the experimental program of instruction, the trainee will be prepared to independently complete the ZVEH [national association of German electrical trades] acceptance protocol in conformance with VDE 0100/Part 610 and VDE 0701 for new and repaired equipment. Literature about this is included.

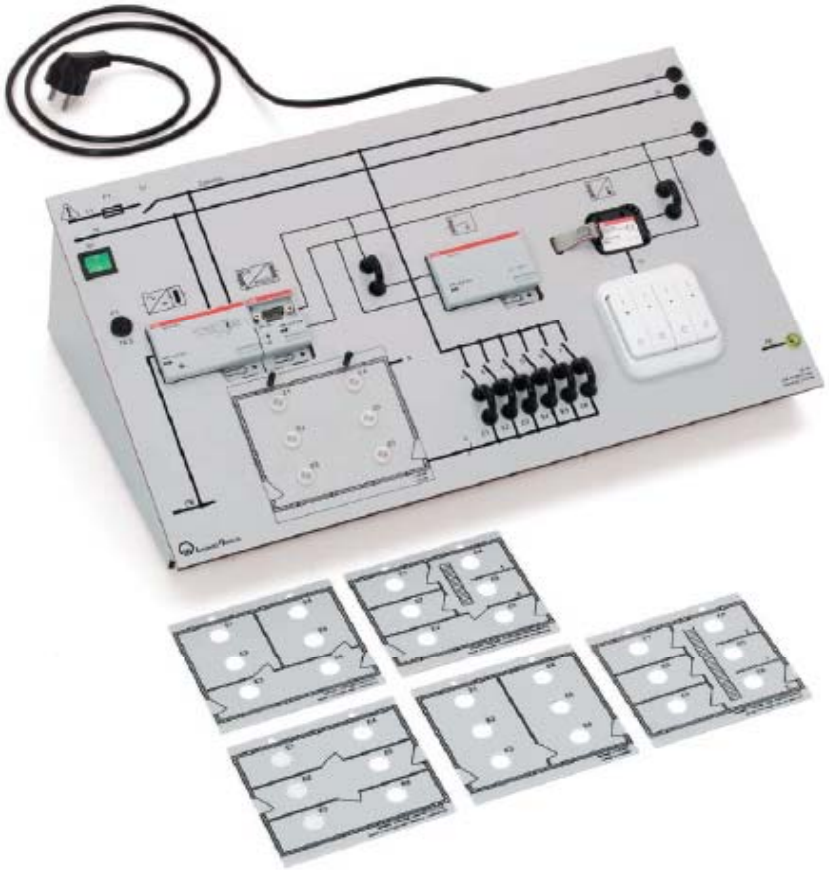
EQUIPMENT LIST T 4.3.4

Test and Fault Simulator VDE

Quantity	Cat.-no	Description
1	729 995	Test and Fault Simulator VDE
1	566 391EN	Book: Protective circuits

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.

T 4.4.1.0 Compact set EIB/KNX



Topics

- Operating program software ETS
- Function of power supply and data interface
- Programming the fourfold push button with LEDs
- Use of 6 binary outputs with programmable timer function
- Planning room lighting with six lights

T 4.4.1.0 Compact set EIB/KNX

Training system for the European Installation Bus - the EIB Basic System

The EIB Basic System (729740) for the European Installation Bus is the intelligent solution for independent laboratory or student practice station. This completely functional system illustrates the essential characteristics and advantages of the EIB because it contains all of the components necessary for experimentation. The training panel can be used when mounted in a frame or as a tabletop unit with slanted experimenting surface.

The configuration of devices in this system permit all classic lamp circuits, such as on/off, change-over, staircase, and many others, to be implemented with bus technology. The binary outputs can be connected to the six built-in lamps or to external AC loads by making connections with 4 mm safety connecting leads. The 5 masks are aids to quickly and comprehensively change the room concept or problem situation.

This basic system‘s training panel can easily be supplemented with other EIB units (e.g. shutter actuators, dimmers, motion detectors, infrared transmitter/receivers).

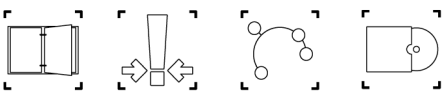
The CBT provides a quick start in the EIB technology.

EQUIPMENT LIST T 4.4.1.0

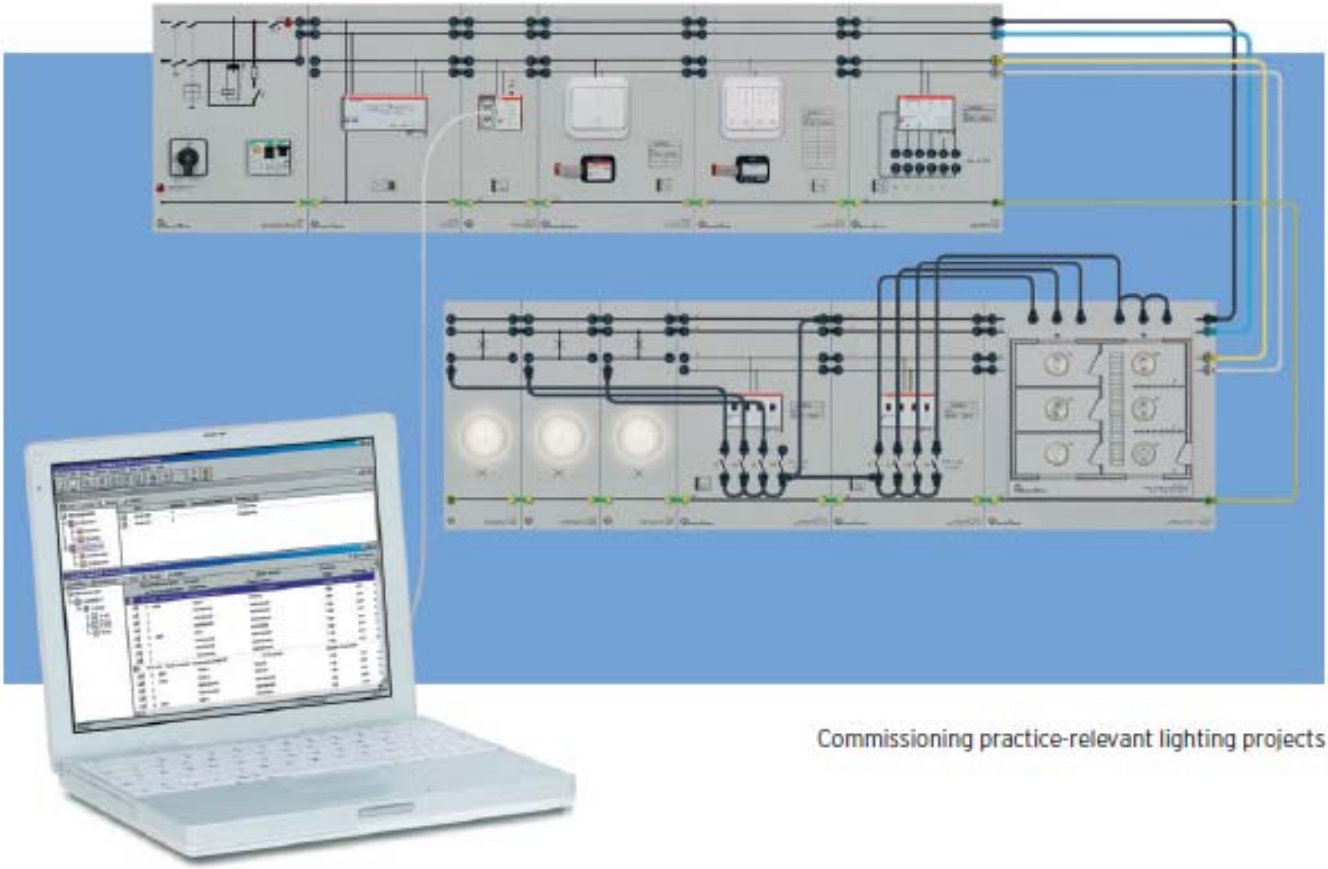
Compact set EIB/KNX

Quantity	Cat.-no	Description
1	729 7401	EIB/KNX basic system starter
1	729 5744	Software: ETS4 Lite with Dongle

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.



T 4.4.1.1 Basics of building management system



Commissioning practice-relevant lighting projects

Topics

- Planning example equipment configurations with ETS
- Telegram setup and information content
- Commissioning planned example equipment configurations with real EIB devices with the aid of the ETS
- Diagnostic and service functions
- Systematic troubleshooting

T 4.4.1.1 Basics of building management system

Building Management

The introduction: The beginner can work her/his way into this new technology, step by step, with easy to comprehend equipment examples. Aside from the EIB‘s basic functions and systematic, this set puts EIB Tool Software (ETS) handling in the forefront. This is the program used to plan and operate all EIB equipment.

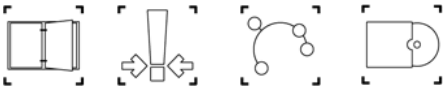
Any of the industrial EIB-REG components can be attached to the configuration via the Data Bus Rail (729 773). This permits universal connection of devices, even those of other manufacturers, so that they can be examined as to their function and behavior on the bus.

EQUIPMENT LIST T 4.4.1.1

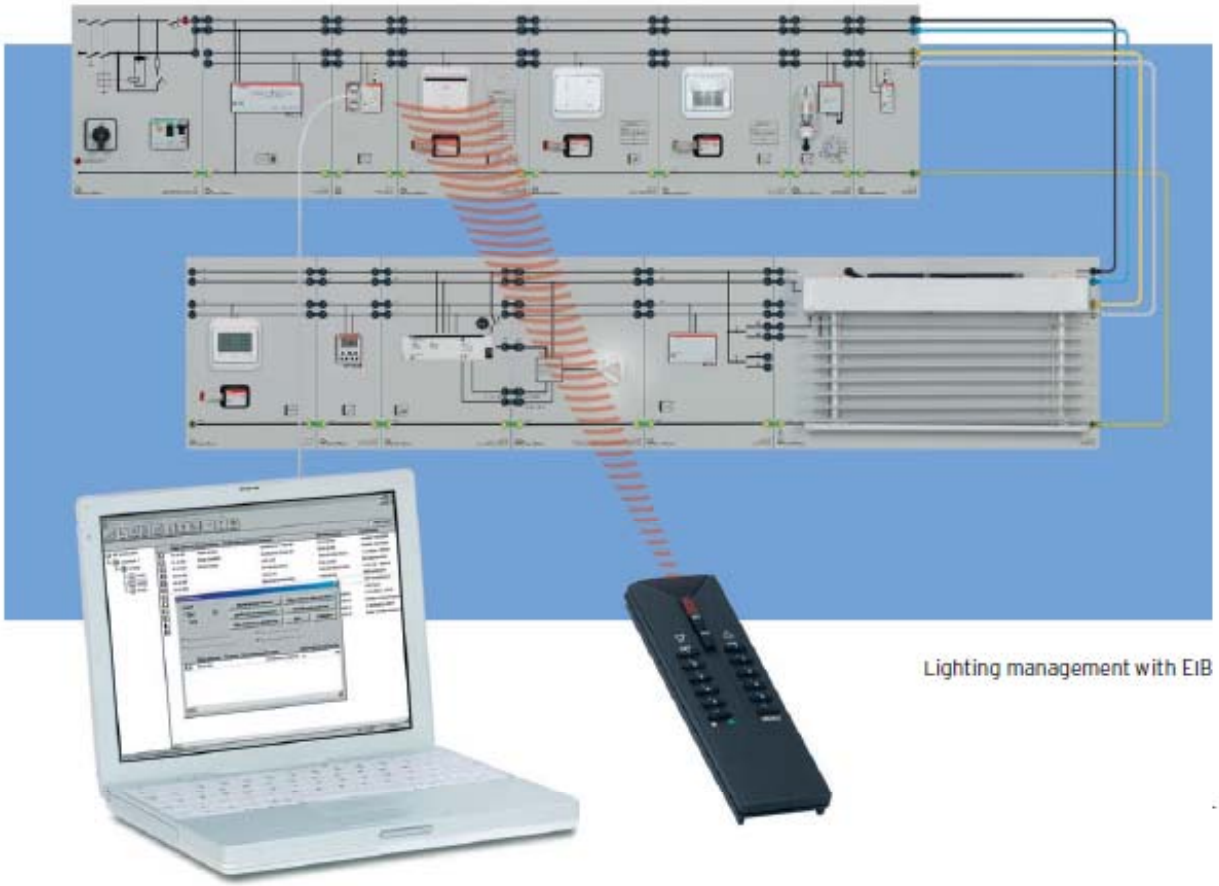
Basics of building management system

Quantity	Cat.-no	Description
3	729 25	Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 759A	Binary Output Four-Fold
1	729 7545	EIB-Push Buttons
1	729 7571	EIB Binary input C/24
1	568 842	Book: Building Service Management Technology EIB, T 4.4

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.



T 4.4.1.2 Lighting management



Lighting management with EIB

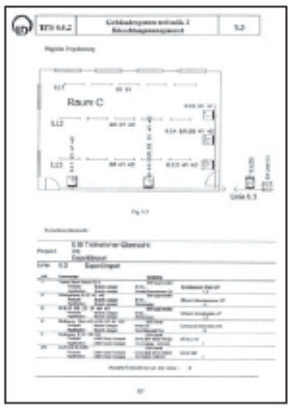
Topics

- Programming multiple light circuits, including dimmer functions and central functions
- Options for binary inputs (dependencies and logical functions)
- Programming brightness control
- Commissioning a timer
- Information output to the data display

T 4.4.1.2 Lighting management

The fundamental objectives and advantages of automated building management systems can be presented on the basis of lighting management. Building system engineering provides the operator with new lighting control functions that yield additional utility, better economics, and more comfort than are possible with conventional electrical installation techniques.

The new bus units primarily, include devices with special functions, such as infrared transceivers or shutter actuators. You can attach any of the industrial EIB-REG components to the configuration via the 729 773 Data Bus Rail. This provides you with a universal method of connecting devices, even those of other manufacturers, so that their function and behavior on the bus can be tested.



Sample reading material

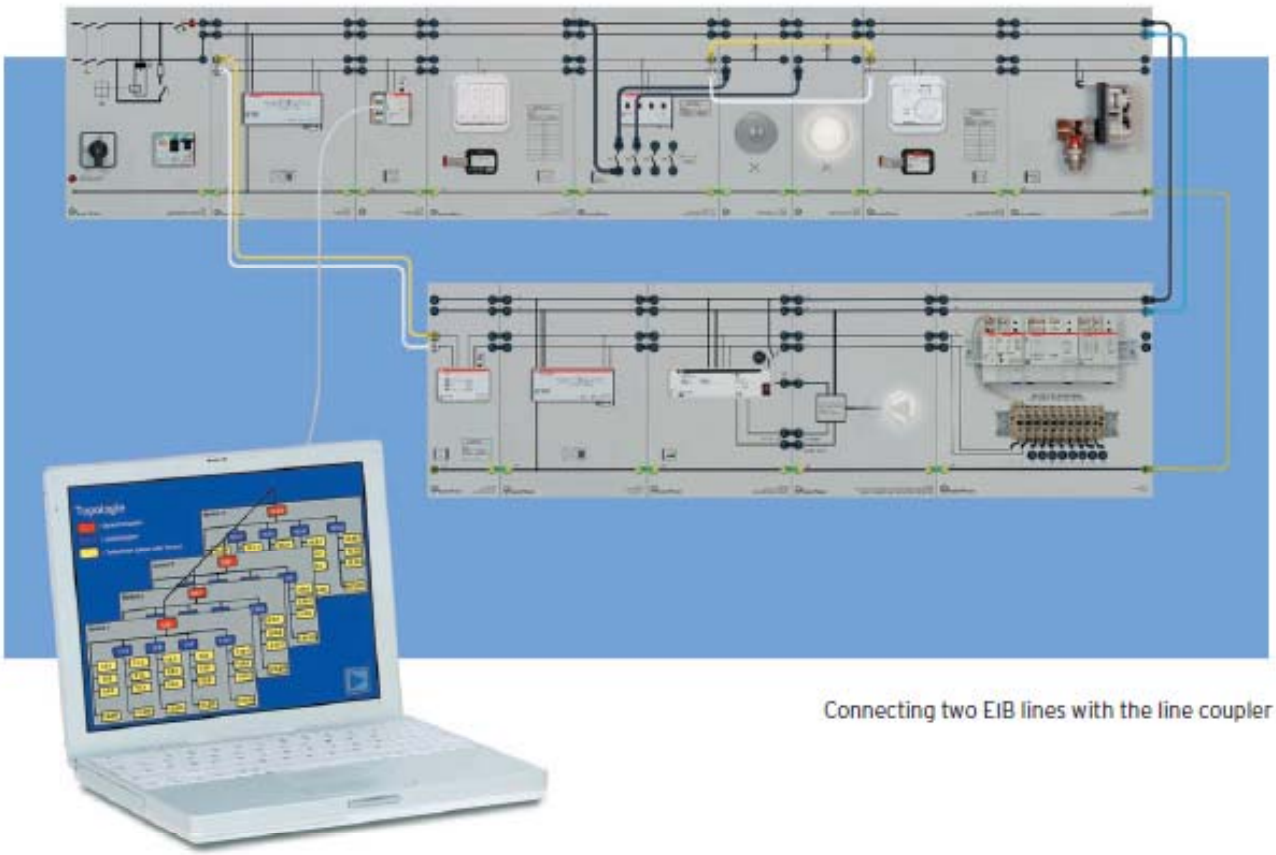
EQUIPMENT LIST T 4.4.1.2

Lighting management

Quantity	Cat.-no	Description
3	729 25	Lamp Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 763	Brightness Control Actuator
1	729 764	Brightness Sensor
2	729 759A	Binary Output Four-Fold
2	729 7571	EIB Binary input C/24
1	729 7611	EIB-Shutter Actuator
1	729 779	Shutter Model
1	568 842	Book: Building Service Management Technology EIB, T 4.4

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.

T 4.4.1.3 Line coupling unit



Connecting two EIB lines with the line coupler

Topics

- ETS program operation, programming a temperature control
- Programming multiple light circuits, including dimmer functions and central functions
- Options for binary inputs (dependencies and logical functions)
- Programming lines via the line coupler

T 4.4.1.3 Line coupling unit

The line coupler subdivides the installation bus into hierarchical sections. It handles primary and secondary lines; whereby these lines remain galvanically separate. Data telegrams can be passed over the coupler or specifically filtered out. The use of line couplers increases the operational security of equipment and prevents unnecessary data from being transmitted over long distances.

EIB controlled radiator valve

You can attach any of the industrial EIB-REG components to the configuration via the 729 773 Data Bus Rail. This provides you with a universal method of connecting devices, even those of other manufacturers, so that their function and behavior on the bus can be investigated.

EQUIPMENT LIST T 4.4.1.3

Line coupling unit

Quantity	Cat.-no	Description
3	729 25	Lamp Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 765	Line Coupler
1	729 766	Analog input 4fold
2	729 759A	Binary Output Four-Fold
1	729 7501	EIB power supply, double
1	729 7502	EIB Choke
3	729 7571	EIB Binary input C/24

The complete set of required material is given in the table at the end of this catalogue. Or simply ask for an actual offer.

Equipment sets

EQUIPMENT LIST T 4.1.1.1

Lamp and Appliance Circuits

Quantity	Cat.-no	Description
1	729 01	On/Off Switch, Double Pole
1	729 02	On/Off Switch, Single Pole
1	729 03	Multiple Switch
1	729 04	Change-Over Switch Left
1	729 05	Cross-Over Switch
1	729 061	Schuko Socket
2	729 07	Pushbutton
1	729 08	Junction Box
1	729 10	Impulse Relay 230 V
1	729 12	Automatic Staircase Switch
1	729 13	Lamp Socket E27
2	729 14	Fluorescent Lamp Socket, Left
2	729 15	Fluorescent Lamp Socket, Right
1	729 16	Spacing Panel
1	729 17	Choke 20 W
1	729 18	Choke 20 W/40 W
1	729 21	Dimmer Inductive Load
1	729 22	Filament Transformer
1	729 23	Automatic Circuit Breaker 10 A
1	729 25	Lamp Socket E27 Series
1	729 26	Change-Over Switch Right
1	729 41	Capacitive Load 0.3
1	505 301	Incandescent lamp 230 V/60 W
1	566 302	Book: Lamp and Appliance Circuits
		Accessories
1	726 18	Panel Frame-T130, Three Level
1	726 71	Single-Phase Supply Unit
2	500 59	Set of 10 safety bridging plugs, black
1	500 591	Safety bridging plugs, yellow/green, set of 10
1	500 852	Safety connecting leads, yellow/green, set of 10
1	500 853	Set of 25 safety connecting leads

Equipment sets

EQUIPMENT LIST T 4.1.4.4

Door Communications systems

Quantity	Cat.-no	Description
1	729 580	Door communication, installation
1	729 5801	Door communication
1	729 581	Door communication, outside
2	729 582	Door communication, inside
2	729 583	Door communication, inside video
2	729 584	Door communication, video ampl.
1	729 596	Door opener
1	729 585	Door communication, outside audio
		Accessories
1	726 10	Panel Frame-T150, Two Level
3	500 59	Set of 10 safety bridging plugs, black
1	500 592	Set of 10 Safety Bridging Plugs with Tap, black
1	500 853	Set of 25 safety connecting leads

EQUIPMENT LIST T 4.1.6

Photovoltaic Systems

Quantity	Cat.-no	Description
1	729 13	Lamp Socket E27
1	729 5011	Accumulator for solar system
1	729 502	Solar Converter (isolated operation)
1	729 5031	Solar panel with lamp
1	729 5051	Solar Charge Controller
		Accessories
1	726 09	Panel Frame-T130, Two Level
3	501 511	Bridging Plugs, Black, set of 10
1	500 641	Safety Connection Lead 100 cm, red
2	500 642	Safety Connection Lead 100 cm blue
2	500 644	Safety Connection Lead 100 cm, black
		Recommended
1	524 013S	Sensor-CASSY 2 - Starter

Equipment sets

EQUIPMENT LIST T 4.1.6

Photovoltaic Systems

Quantity	Cat.-no	Description
1	729 13	On/Off Switch, Double Pole
1	729 5011	On/Off Switch, Single Pole
1	729 502	Multiple Switch
1	729 5031	Change-Over Switch Left
1	729 5051	Cross-Over Switch
		Accessories
1	726 09	Panel Frame-T130, Two Level
3	501 511	Bridging Plugs, Black, set of 10
1	500 641	Safety Connection Lead 100 cm, red
2	500 642	Safety Connection Lead 100 cm blue
2	500 644	Safety Connection Lead 100 cm, black
		Recommended
1	524 013S	Sensor-CASSY 2 - Starter

EQUIPMENT LIST T 4.3.3

Trainer Artificial Mains Network

Quantity	Cat.-no	Description
1	729 865	Experimental suitcase protection circuits VDE0100
1	566 395EN	Book: Protection against electric blow
		Recommended
1	727 291	SATURN 100 Plus

Equipment sets

EQUIPMENT LIST T 4.3.4

Test and Fault Simulator VDE

Quantity	Cat.-no	Description
1	729 995	Test and Fault Simulator VDE
1	566 391EN	Book: Protective circuits
		Accessories
1	500 853	Set of 25 safety connecting leads
		Recommended
1	727 291	SATURN 100 Plus

EQUIPMENT LIST T 4.4.1.0

Compact set EIB/KNX

Quantity	Cat.-no	Description
1	729 7401	EIB/KNX basic system starter
1	729 5744	Software: ETS4 Lite with Dongle
		Personal Computer with operating system required !!!

Equipment sets

EQUIPMENT LIST T 4.4.1.1

Basics of building management system

Quantity	Cat.-no	Description
3	729 25	Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 759A	Binary Output Four-Fold
1	729 7545	EIB-Push Buttons
1	729 7571	EIB Binary input C/24
		Accessories
1	726 10	Panel Frame-T150, Two Level
1	729 5744	Software: ETS4 Lite with Dongel
1	729 7401	EIB/KNS basic system starter
3	500 59	Set of 10 safety bridging plugs, black
2	500 591	Safety bridging plugs, yellow/green, set of 10
	500 620	Safety Connection Lead 50 cm yellow/green
1	500 853	Set of 25 safety connecting leads
1	568 842	Book: Building Service Management Technology EIB, T 4.4
		Personal Computer with operating system required !!!
		Recommended
1	729 742	Switching/Dimming Actuator
1	729 744	Weekly Time Switch
1	729 749	4 pushbutton display EIB
1	729 762	Elec. Motor-Driven Actuator
1	729 772	Room Temperature Controller
1	729 773	Data Bus Rail
1	729 775	Dimmable Compact Fluorescent Lamp with ECG
1	729 779	Shutter Model

Equipment sets

EQUIPMENT LIST T 4.4.1.2

Lighting management

Quantity	Cat.-no	Description
3	729 25	Lamp Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 763	Brightness Control Actuator
1	729 764	Brightness Sensor
2	729 759A	Binary Output Four-Fold
2	729 7571	EIB Binary input C/24
1	729 7611	EIB-Shutter Actuator
1	729 779	Shutter Model
		Accessories
1	726 10	Panel Frame-T150, Two Level
1	729 5744	Software: ETS4 Lite with Dongel
1	729 7401	EIB/KNX basic system starter
3	500 59	Set of 10 safety bridging plugs, black
2	500 591	Safety bridging plugs, yellow/green, set of 10
	500 620	Safety Connection Lead 50 cm yellow/green
1	500 853	Set of 25 safety connecting leads
1	568 842	Book: Building Service Management Technology EIB, T 4.4
		Personal Computer with operating system required !!!
		Recommended
1	729 5734	Software: ETS4 Pro with dongle
1	729 742	Switching/Dimming Actuator
1	729 744	Weekly Time Switch
1	729 749	4 pushbutton display EIB
1	729 762	Elec. Motor-Driven Actuator
1	729 772	Room Temperature Controller
1	729 773	Data Bus Rail
1	729 775	Dimmable Compact Fluorescent Lamp with ECG
1	729 779	Shutter Model
1	729 7545	EIB-Push Buttons

Equipment sets

EQUIPMENT LIST T 4.4.1.3

Line coupling unit

Quantity	Cat.-no	Description
3	729 25	Lamp Socket E27 Series
3	505 301	Incandescent lamp 230 V/60 W
1	729 765	Line Coupler
1	729 766	Analog input 4fold
2	729 759A	Binary Output Four-Fold
1	729 7501	EIB power supply, double
1	729 7502	EIB Choke
3	729 7571	EIB Binary input C/24
		Accessories
1	726 10	Panel Frame-T150, Two Level
1	729 5744	Software: ETS4 Lite with Dongel
1	729 7401	EIB/KNS basic system starter
3	500 59	Set of 10 safety bridging plugs, black
2	500 591	Safety bridging plugs, yellow/green, set of 10
	500 620	Safety Connection Lead 50 cm yellow/green
1	500 853	Set of 25 safety connecting leads
		Personal Computer with operating system required !!!
		Recommended
1	729 5734	Software: ETS4 Pro with dongle
1	729 742	Switching/Dimming Actuator
1	729 744	Weekly Time Switch
1	729 749	4 pushbutton display EIB
1	729 762	Elec. Motor-Driven Actuator
1	729 772	Room Temperature Controller
1	729 773	Data Bus Rail
1	729 775	Dimmable Compact Fluorescent Lamp with ECG
1	729 779	Shutter Model
1	729 7545	EIB-Push Buttons

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