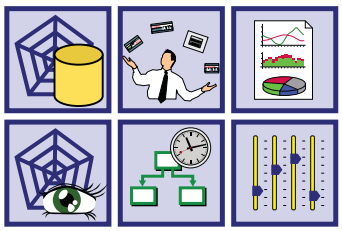
LINX-150 Automation Server
BACnet & CEA-709 Controller

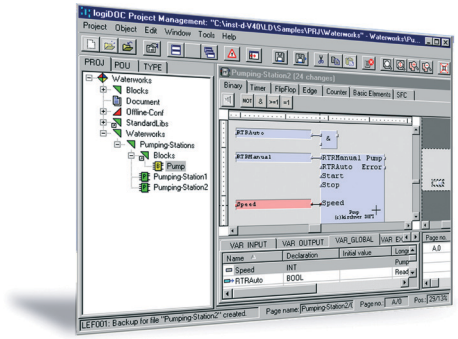


L-INX Automation Servers LINX-150 and LINX-151 are automation stations with expansion options to couple L-IOB I/O modules via LOYTEC LIOB Connect and LIOB FT. The powerful Automation Servers provide connectivity features to integrate into CEA-709 (LonMark Systems) and BACnet networks. The LINX-150 has a built-in Remote Network Interface (RNI) to get access to the TP/FT-10 channel from the Ethernet/IP side. The LINX-151 features two integrated Routers. One IP-852 Router with comprehensive L-IP functionality plus one BACnet/IP Router with BBMD and slave proxy functionality.

The Automation Servers feature two 100Base-T Ethernet ports with an integrated Ethernet switch. Multiple L-INX Automation Server can be attached in series to an Ethernet ring. If the Ethernet ring is connected to an Ethernet switch which supports the Spanning Tree Protocol, a reliable communication system is established.

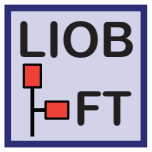
The combination of free programmability (IEC 61131-3), an integrated OPC server, customized visualization with LWEB-800 (Graphical User Interface), gateway functions, alarming, scheduling, trending and e-mail notification opens multiple uses for building automation in distributed property and buildings of any size. The application range extends from the control, regulation and supervision of building services to energy management.

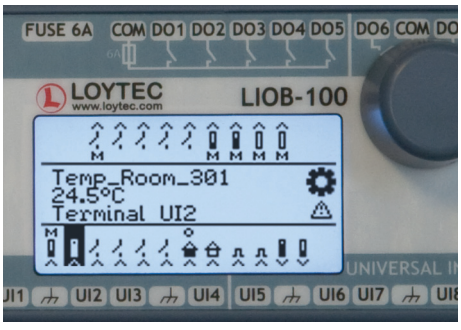
Controller



The L-INX Automation Server can be used as a controller for various applications due to its built-in PLC functionality. Several IEC 61131-3 programs can run in parallel with different cycle times. IEC 61131-3 applications can be changed during operation and are loaded into the device without interrupting the currently running program. An online test via Ethernet (TCP/IP) or TP/FT-10, and offline simulation help create the application and support troubleshooting.

L-IOB I/O Modules can be directly coupled to a L-INX Automation Server through the LIOB Connect functionality. LIOB FT Modules connect remote I/O through the LIOB FT channel (LonMark TP/FT-10 channel). All L-IOB I/O modules are automatically identified and coupled to the L-INX Automation Servers (Plug and Play). Thus the I/O data points are available for use with the L-INX Automation Server application. The data points are available for operation via the Web front end. All configurations of the L-IOB modules are stored by the L-INX Automation Server and loaded into the L-IOB device. A replacement of I/O modules is done with a few simple steps without configuration tools.





Both L-INX Automation Servers and L-IOB modules contain a 128x64 display with backlight. The display shows device and data point information. A jog dial is used for local operation by displaying detailed information on the display and for operation and override of data points. Any L-IOB module connected to the L-INX Automation Server can be accessed by the L-INX for manual operation.

Manual operation via remote access using VNC (Virtual Network Computing) is available. Every LINX-150 and LINX-151 Automation Server together with its connected I/Os can be operated remotely from mobile devices or a PC via VNC, even if the devices themselves are not physically accessible.

Integration Platform

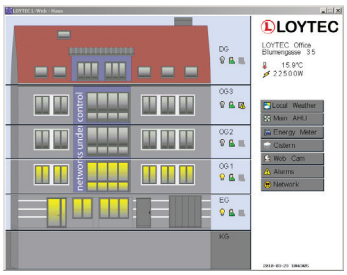
LINX-150 Automation Servers can be either connected through their Ethernet/IP ports to LonMark IP-852 and BACnet/IP simultaneously or to TP/FT-10 and BACnet MS/TP channels respectively. LINX-151 with a built-in IP-852 Router and BACnet/IP Router can communicate on all channel types at the same time.

Static and dynamic NVs for CEA-709 are available. In addition to SNVTs also User Defined NVs (UNVTs) and Configuration Properties (SCPTs, UCPTs) are supported. In case of BACnet the L-INX Automation Server complies with the B-BC (BACnet Building Controller) profile. Communication takes place both via BACnet Server Objects as well as Client Mappings. The integration of Modbus (RTU and TCP) and M-Bus is provided by the L-INX Automation Servers as well. The L-MBUS level converter is needed to connect an M-Bus channel. The built-in OPC server (OPC XML-DA) allows

client applications to access predefined OPC data points via Web services. For OPC DA clients based on Microsoft's COM/DCOM technology (OPC DA 2.0.5) the bridge software LOPC-800 is available. All data points are available in a tree structure on the integrated Web server to be displayed or set using a standard Web browser. The integrated gateway functionality enables data exchange between all communication technologies available on the device. This makes the L-INX Automation Servers a high performance integration platform.

OPC Server

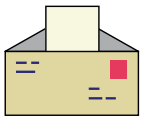
All technology data points used by the L-INX Automation Server - whether SNVTs, UNVTs or Configuration Properties from the CEA-709 network, BACnet Server Objects and Client Mappings, data points from Modbus or M-Bus, or I/O values of connected L-IOB I/Os - can be automatically mapped to OPC data points. The L-INX Automation Server provides OPC data points fully technologically independent via its OPC XML-DA Server to higher-level systems such as the L-WEB System or a SCADA system of a third-party supplier.

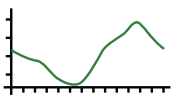


Operator Functions and Monitoring

Customized graphic pages with dynamic content are hosted by the L-INX Automation Servers and appear via Web services with LWEB-800 Visualization (free available .NET application, see product catalog, page 10) on Windows PCs and Windows Mobile devices. The use of popular graphic formats (PNG, JPG, BMP, TIFF, GIF animated) facilitate the design of graphic pages. Links between individual graphic pages allow a user-driven navigation. With the UCS-16 character set of the Unicode Standard (ISO 10646) any language including Chinese, Japanese, and Korean (CJK) is supported.

The use of Web services for data communication allows an easy integration into any IT infrastructure. Data points from different L-INX Automation Servers can be processed in one graphic page. Also links between graphic pages from different L-INX Automation Servers are possible. This allows the design of a distributed visualization to operate and monitor the connected systems. Information from the different communications environments are made visible and operable in a uniform way to the user.





Local Data Storage, Data Provision and Reporting

L-INX Automation Servers can store trend and event logs locally and provide the logged data to the L-WEB System via Web services. In addition, trend and event logs can be read via FTP as CSV files or sent as an e-mail attachment from the Automation Servers. Of course trend data are also available to other BACnet devices or a BACnet Building Workstation. LWEB-801 Server is a powerful solution to store long-term data in a SQL database. For use with LWEB-801 LOYTEC provides LWEB-830 Dream Report (see product catalog, page 17) as an option for analyzing and presenting the data.

Scheduler

Schedulers and calendars located on the L-INX Automation Server are configured with the L-INX Configurator and parameterized via the LWEB-800 Visualization or the integrated Web server. There is the possibility of remote access to other LOYTEC devices, which also host schedulers. BACnet Schedule Objects on remote BACnet devices can be accessed as well as BACnet clients can access the schedulers on the LINX-150 and LINX-151. Centralized management of schedulers on one or multiple distributed L-INX Automation Servera is done with the LWEB-820 Master Schedule Configurator (see product catalog, page 14).

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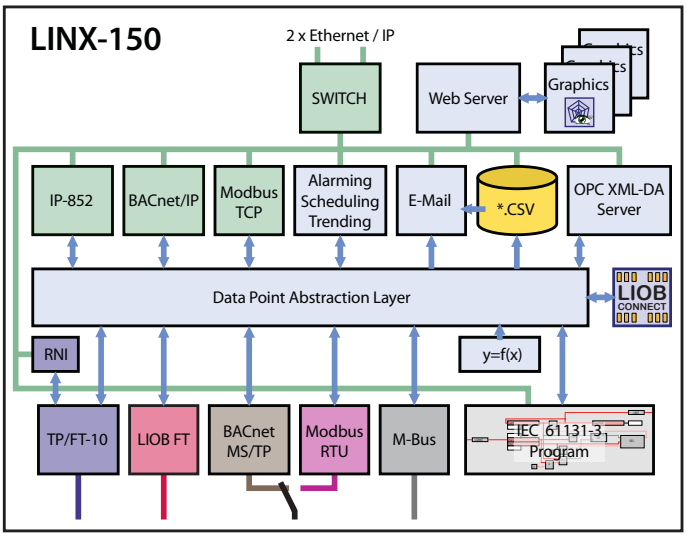
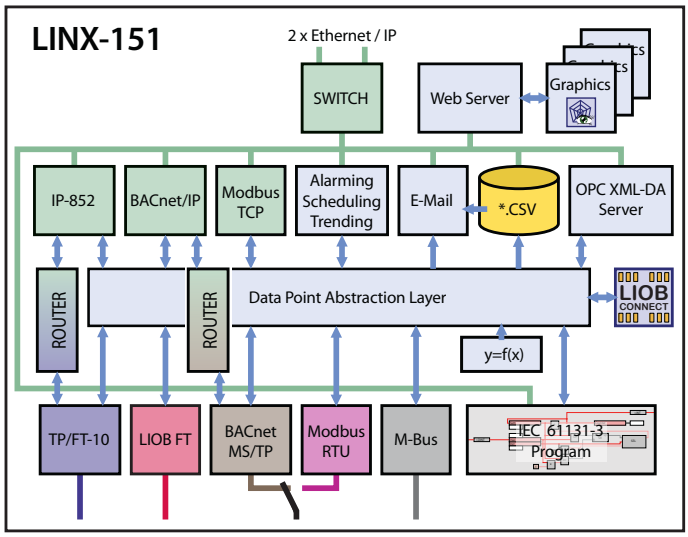
Alarming

The L-INX Automation Servers support alarming according to the LonMark profile definition and BACnet Intrinsic Alarming via BACnet Notification Class Objects concurrently. Alarms are available on the LWEB-800 Visualization or via the integrated Web server. Alarm logs are stored on the device and synchronized to an available LWEB-801 Server. Alarm logs can be read via FTP from the L-INX Automation Server or forwarded event-driven to any e-mail recipients via e-mail.





Features:

- IEC 61131-3 programmable with L-LOGICAD
- Physical inputs and outputs with L-IOB I/O Modules (LIOB Connect & LIOB FT)
- 128x64 display with backlight
- Local and remote access to information about device status and data points
- Manual operation using the jog dial or VNC client
- Memory expansion with microSD card
- Alarming, Scheduling, and Trending (AST™)
- Event-driven e-mail notification
- Managing of customized graphical pages
- Monitoring and control through LWEB-800 Visualization
- Built-in OPC XML-DA Server
- Data point access via Web services
- Access to network statistics
- Compliant with ANSI/ASHRAE-135-2008 and ISO 16484-5 standard
- Supports BACnet MS/TP or BACnet/IP
- BACnet Client Function (Write Property, Read Property, COV Subscription)
- BACnet Client Configuration with configuration tool (Scan and EDE import)
- B-BC (BACnet Building Controller) functionality
- Compliant with CEA-709, CEA-852, ISO/IEC 14908 standard (LonMark Systems)
- Supports TP/FT-10 or IP-852 (Ethernet/IP)
- Support of CEA-709 dynamically created network variables or static network variables
- Support of CEA-709 user-defined NVs (UNVTs) and Configuration Properties (SCPTs, UCPTs)
- CEA-709 Remote Network Interface (RNI) with 2 MNI devices (LINX-150 only)
- Integrated BACnet/IP to BACnet MS/TP Router (LINX-151 only)
- Integrated IP-852 to TP/FT-10 Router (LINX-151 only)
- M-Bus Master according to EN 13757-3
- Connection of M-Bus devices via optional M-Bus Converter (e.g. L-MBUS80)
- Modbus TCP and Modbus RTU (Master or Slave)
- Integrated Web server for the device configuration and for monitoring of data points
- Configurable via Ethernet/IP, USB, or TP/FT-10

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Specifications		
Dimensions (mm)	159 x 100 x 75 (L x W x H)	
Power supply	24 VDC / 24 VAC ±10 %, typ. 2.5 W	
Interfaces	2 x Ethernet (100Base-T) OPC XML-DA, BACnet/IP, LonMark IP-852, Modbus TCP (Master or Slave), HTTP, FTP	1 x TP/FT-10 (LonMark System) 1 x LIOB FT 1 x BACnet MS/TP or Modbus RTU (Master or Slave) 1 x M-Bus (Master EN 13757-3) 1 x LIOB Connect 2 x USB-A, 1 x USB-B (PC)
L-IOB I/O Modules	Up to 8 LIOB FT Modules Up to 8 LIOB Connect Modules (4 direct coupled, next 4 modules via 2 x LIOB-A2 and power supply e.g. LPOW-2415A)	
Remote Network Interface (RNI)	1 RNI with 2 MNI devices (LINX-150 only)	
BACnet/IP Router	1 (LINX-151 only)	
CEA-709 Router	1 (LINX-151 only)	
Program Cycle Time	Down to 10 ms	
Programming, Tools	L-LOGICAD Software (IEC 61131-3), L-INX Configurator	

Resource limits			
IEC 61131-3 Variables	1 000	LonMark Calendar	1 (25 Calendar Templates)
OPC XML-DA data points	5 000	LonMark Scheduler	100
BACnet Server Objects	1 000 (Analog, Binary, Multi-State)	LonMark Alarm Server	1
BACnet Client Mappings	1 000	CEA-709 trend logs	100
BACnet Calendar Objects	25	E-mail templates	100
BACnet Scheduler Objects	100 (64 data points per object)	Math objects	100
BACnet Notification Class Objects	32	Alarm logs	10
BACnet Trend Log Objects	100 (390 000 logs, ≈ 6 MB)	M-Bus data points	1 000
CEA-709 Network Variables (NVs)	1 000	Modbus data points	2 000
CEA-709 Alias NVs	1 000	Data point connections	2 000
CEA-709 External NVs (Polling)	1 000	Number of LWEB-800 clients	15 (simultaneously)
CEA-709 Address Table Entries	512 („legacy mode“: 15)		

Order number	Configuration	Page
LINX-150	BACnet & CEA-709 Automation Server with LIOB Connect and built-in Remote Network Interface (RNI)	
LINX-151	BACnet & CEA-709 Automation Server with LIOB Connect and built-in BACnet/IP & IP-852 Router	
LINX-START-150	Starter Kit: LINX-150, LIOB-101, LIOB-102 and L-LOGICAD License	
LIOB-A2	L-IOB Adapter 2 to split the line of modules on the DIN rail for space and power considerations	43
LIOB-100	LIOB Connect I/O Module: 8 UI, 2 DI, 2 AO, 9 DO (4 x Triac, 5 x Relay 6 A)	43
LIOB-101	LIOB Connect I/O Module: 8 UI, 16 DI	43
LIOB-102	LIOB Connect I/O Module: 6 UI, 6 AO, 8 DO (Relay 6 A)	43
LIOB-103	LIOB Connect I/O Module: 6 UI, 6 AO, 5 DO (Relay 16 A)	43
LIOB-131	LIOB Connect DALI Controller, 1 x DALI channel, integrated DALI power supply	43
LIOB-150	LIOB FT I/O Module: 8 UI, 2 DI, 2 AO, 8 DO (4 x Triac, 4 x Relay 6 A)	43
LIOB-151	LIOB FT I/O Module: 8 UI, 12 DI	43
LIOB-152	LIOB FT I/O Module: 6 UI, 6 AO, 8 DO (Relay 6 A)	43
LIOB-153	LIOB FT I/O Module: 6 UI, 6 AO, 5 DO (4 x Relay 16 A, 1 x Relay 6 A)	43
LPOW-2415A	LIOB Connect power supply, 24 VDC, 15 W	46
LPOW-2415B	Power supply with external power connector 24 VDC, 15 W	46
LOPC-BR800	OPC Bridge (PC software) to connect OPC DA clients (COM/DCOM) with L-INX Automation Servers	75
L-MBUS20	M-Bus level converter for 20 M-Bus devices	47
L-MBUS80	M-Bus level converter for 80 M-Bus devices	47

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