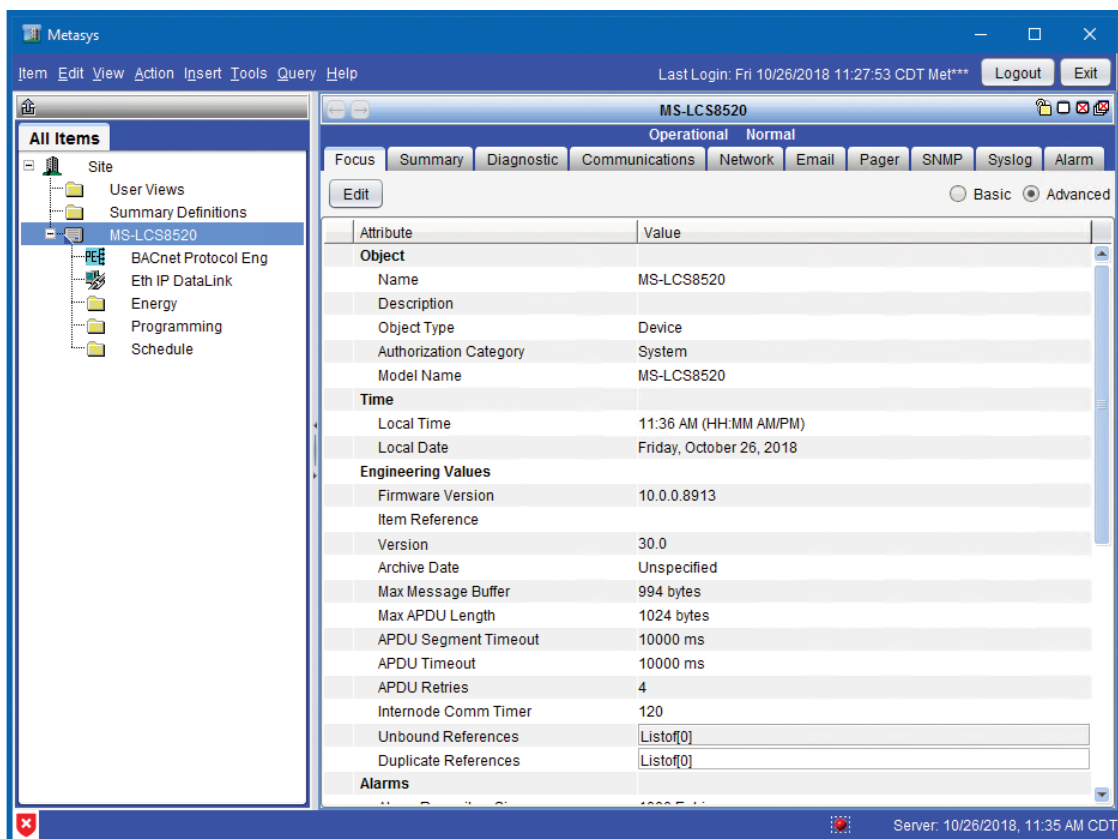


LCS85 Product Bulletin



MS-LCS85SW-x

Johnson Controls
www.johnsoncontrols.com

LIT-12011549
2018-12-17 Release 10.0

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LonWorks® Control Server (LCS) 85 Overview

The LonWorks® Control Server (LCS) 85 uses an open-architecture flat LonWorks system to monitor and supervise HVAC equipment, lighting, security, fire, and access control. The LCS85 supports a comprehensive set of supervisory features and functions for large facilities and technologically advanced buildings and complexes. The LCS85 is a high-capacity server that allows the integration of large LonWorks network systems. When configured as the Site Director, the LCS85 can support up to four *Metasys*® network engines.

A single LCS85 within a building provides monitoring and control, alarm and event management, data exchange, trending, energy management, scheduling, and data storage.

The LCS85 supports 10,000 objects, but is capable of supporting up to 25,000 objects when enhanced with a 15,000-object upgrade.

The LCS85 has an embedded user interface that supports concurrently connected web browsers with password access control and the security protection technology of the IT industry.

For details about LCS8520 hardware and software requirements, see [LCS85 Technical Specifications](#). For information about product ordering, see [Ordering Information](#).

Features and Benefits

CEA-852 Tunneling

Extends the distance of hard-wired field controllers, and minimizes the cost of remote installations by eliminating the need of a local network engine.

Communication Using Commonly Accepted IT Standards at the Automation and Enterprise Level

Installs on the existing IT infrastructure within a building or enterprise and integrates the existing network using standard IT communication services over the company intranet, wide area network, or public Internet with firewall protection.

Web-Based User Interface

Provides user access to LCS85 system data from any supported web browser device connected to the network and eliminates need for separate web server.

Site Director Function

Provides user access to all data on one site through one device; the Site Director coordinates the display of data from multiple LCS85s for easy navigation through the entire site.

Embedded Site Management Portal System Configuration Software

Provides user with password-protected access to system configuration, monitoring, commanding, and diagnosis from any device with web browser software without the need for separate workstation software.

Support for Web Services at the Automation Network Level

Develops facility-specific advanced data interfaces and applications.

Supervision of Field Controller LonWorks Networks

Supports connectivity to open network standards for complete flexibility in selection of field devices. Supported protocols include LonWorks and BACnet/IP.

Trending, Totalization, and Alarming Functions Automatically Regenerated in the *Metasys* System

Protects functionality using the data recording capabilities, fully integrates processing presentation, and provides storage of LonWorks network data in the web-enabled system.

Scalable System Integration Solution for Integrating and Migrating LonWorks Networks

Integrates LonWorks devices in one building, a network of small buildings, or multiple LonWorks networks in a large building complex, providing new technology while protecting existing investment.

Support for up to 25,000 Objects

Minimizes the quantity of required network engines and accommodates large LNS databases.

LCS85 Networking

The LCS85's unique ability within a *Metasys* system is integrating LonWorks networks over IP. This network integration allows you to build an extremely flexible network at the automation and enterprise level of your system, as well as at the field controller and data acquisition levels.

Object Support

The LCS85 supports 10,000 objects on the LonWorks network, but is capable of supporting up to 25,000 objects if you use MS-15KUPG-0 to enhance the LCS85 with a 15,000-object software upgrade. If you upgrade your system, the maximum amount of permanent status objects is 11,000. Permanent status objects include COV Trends (not sample-based), Alarm Extensions, Global Data Shares, and other objects involved in logic or other *Metasys* features. For a complete list of permanent status objects, refer to the *LonWorks® Network Integration with NAE and LCS Technical Bulletin (LIT-1201668)*.

Launcher Application

The Launcher is a software application that lets you access any LCS85 server or network engine on the building network, regardless of its software version. If the Launcher is not already installed on your machine, you are prompted to install it when you browse to any *Metasys* server or network engine on the building network. After you install the Launcher software, use it to launch the SMP UI. Refer to the *Launcher Tool Help (LIT-12011742)*.

IP Ethernet Network

The LCS85 connects directly to IP Ethernet networks running at 10, 100, or 1,000 Mbps. Multiple LCS85s communicate with each other over the network, and one LCS85 can act as the Site Director. Authorized users log in to the Site Director via a supported browser to access the entire *Metasys* system for the site. Data transmission on the network uses standard IT protocols, services, and formats. Networks in different buildings may be interconnected using standard WAN technologies and network service providers. The speed of transmission depends on the technology used.

Remote Site Communication

Remote access to the LCS85 SMP UI can be established from any computer on the building network, or set up over the Internet using an Internet service provider (ISP) line to the LCS85 Ethernet port. Local access is also possible directly from the LCS85 server.

ADS/ADX

The ADS/ADX (Application and Data Server/Extended Application and Data Server) is an optional software package running on a computing platform that provides a location for long-term storage of the system configuration database, trend logs, alarm logs, audit trails, and graphics.

An ADS/ADX can also be configured as the Site Director to allow more concurrent users and coordinate access to all components on a site via a web browser connected over the network or Internet. Refer to the *Application and Data Server (ADS) and Extended Application and Data Server (ADX) Product Bulletin (LIT-1201525)* for more information about ADSs and ADXs.

Automation Level Communication

The LCS85 communicates internal system data using peer-to-peer messaging over the IP Ethernet network. Each LCS85 shares data and has access to information on the other LCS85s connected on the network, which enables coordination and control of the entire building management system.

LonWorks Network

The LCS85 supervises LonWorks devices using LonMark® guidelines. The LonWorks network interface supports all LonMark certified devices, including Johnson Controls® devices, such as the LN Series Controllers, the NexSys controller line, including the LonWorks programmable FSC.

BACnet Protocol

Although the primary function of the LCS85 is to supervise many LonWorks devices over an IP network, it can also integrate devices through BACnet/IP communications. For example, a preferred metering device that uses BACnet/IP could be used with the Demand Limiting Load Rolling (DLLR) feature to shed appropriate loads on the LonWorks network.

Flat LonWorks System

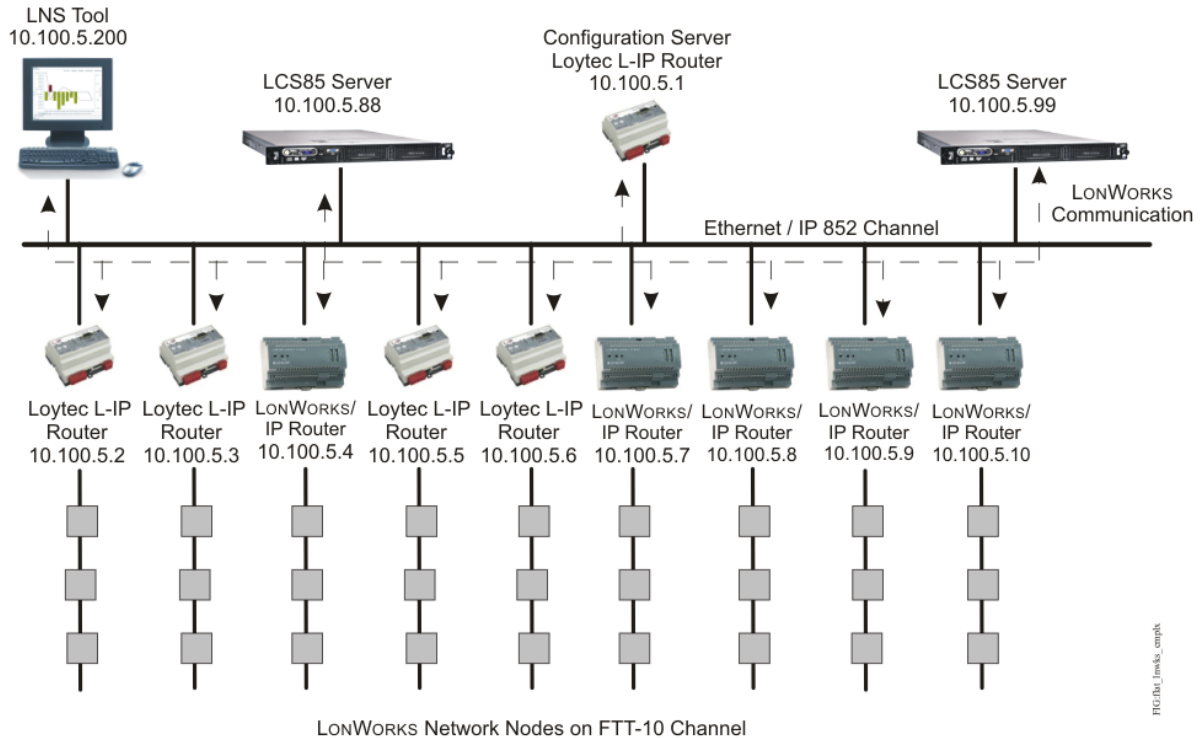
The LCS85 integrates into the LonWorks network using an open-architecture flat LonWorks system. In a basic flat LonWorks system, the network is managed by a single, LNS Computer running an LNS-based network management tool, such as LN Builder or LonMaker.

The LCS85 communicates over the TCP/IP network with LonWorks IP routers using the CEA 852-A protocol standard. In a flat LonWorks system, a Configuration Server is necessary to manage the membership of the channel so that all devices can route traffic to one another.

① **Note:** The designated Configuration Server must be either a Loytec L-IP router or an Echelon Configuration Server. See Table 1 for ordering information.

The following example shows a complex flat LonWorks system setup with the Configuration Server positioned at IP address 10.100.5.1.

Figure 1: Flat LonWorks System



Refer to the *LonWorks® Network Integration with NAE and LCS Technical Bulletin (LIT-1201668)* for more information on the LonWorks network and flat LonWorks system.

Software for Efficient Building Operation

The LCS85 supports virtual environments, including VMWare® and Microsoft® Hyper-V™. Refer to the *Network and IT Guidance Technical Bulletin (LIT-12011279)* for more information.

The LCS85 installs with the latest version of the *Metasys* system software, which provides the following features:

- **Site Management Portal User Interface** provides data and graphic screens to supported web browsers. Authorized users log in to the LCS85 using the Launcher application to access the SMP. This embedded user interface is ideal for smaller networks and remote locations where a dedicated computer platform to support a user interface is not required.
- **System Security** enables an LCS85 to recognize legitimate users with valid user IDs and passwords at the SMP UI. User access data is encrypted in the transmission and in the LCS85 database. The system administrator manages user profiles, authorization levels, user ID, password, and specific LCS85 data access privileges in each user account.
- **Basic Access** allows access to a subset of the standard SMP capabilities based on their assigned permissions.
- **RADIUS Server Accounts** allow you to optionally authenticate non-local users through a Remote Authentication Dial-in User Services server.
- **Monitoring and Control** collects data from the field devices and then coordinates and sends the

required commands to the controlled equipment at the required priority.

- **Global Search** allows you to search the *Metasys* system and manage lists of objects, which can be used by other features for commanding, trending, reporting, and object selection.
- **Global Command** allows you to send a single command to multiple objects, and view a log of the command results.
- **Transaction Recording** audits and logs all user actions performed through the LCS85.
- **Alarm and Event Processing** enables the LCS85 to send alarm and event messages to web browsers, pagers, email servers, Network Management Systems, and serial printers, as well as store and view alarm and event logs on the LCS85 and transfer it to an ADS/ADX or ODS.
- **Historical Trend Data** can be collected by the LCS85 for any monitored value at user-defined intervals, or trending can be based on COV. You can use trend logs to analyze building system performance and locate system problems. LCS85 trend logs can be transferred to the ADS/ADX or ODS at defined intervals or when the LCS85 logs are full.
- **Totalization Data** allows you to monitor energy (and other consumables) use and generate cost reports to support utility cost reductions, and also provides data for service, maintenance, and early identification of building system problems.
- **Trend Studies** allows you to view multiple trend extensions based on the selection of items.
- **Scheduling** allows you to define occupancy periods and start and stop times for mechanical or electrical equipment. Operating parameters can be set according to time of day, days of the week, holiday, or for calendar dates.
- **Network-Wide System Interlocking** enables the LCS85 to collect field controller data, make logical comparisons, and issue relevant commands to other field controllers anywhere on the network. Interlocking also enables data sharing between controllers.
- **Optimal Start** automatically determines the best time to start heating and cooling systems to ensure that the facility is ready for occupants. It adjusts to seasonal variations and reduces energy use.
- **DLLR** monitors energy meters for electricity, gas, steam, or water, and helps control energy consumption. Demand Limit helps manage utility demand charges. Load Rolling controls equipment operating levels to reduce total energy consumption. Comfort overrides prioritize equipment shedding.

Conclusion

The LCS85 affirms Johnson Controls position as a leader in the BAS industry and as an innovator of solutions for the complete management of buildings. The integration of IT and Internet standards into the LCS85 platform, as well as the use of open protocols for field networks, bring the benefits of the global communications and control industries into one system. Web browser-based access from any location is key to the effective use of the automation network.

The *Metasys* system continues to be the integrating network within buildings and has now been extended to bridge the gap between traditional control systems and the business and communication network systems of the enterprise.

The LCS85 and *Metasys* web-enabled network are wise investments that yield returns to the building owner and operator far into the future.

Ordering Information

Table 1 provides the product code numbers for the LCS85 and its accessories. A flat LonWorks system requires a minimum of either one Loytec L-IP router designated as the Configuration Server, or an Echelon® Configuration Server. If you upgrade the system using MS-15KUPG-0, the maximum number of permanent status objects is 11,000. Refer to the *LonWorks® Integration with NAE and LCS Technical Bulletin (LIT-1201668)* for a complete list of permanent status objects.

Table 1: LCS85 and LCS85 Accessory Ordering Information

Product Code Number	Description
MS-LCS85SW-0	License to enable the LCS85 software and the LonWorks software driver for new installations or projects
MS-LCS85SW-6	License to enable the LCS85 software for upgrading existing LCS85s
MS-LCS85SW-SCS	Software subscription for LCS85 software, one year
MS-LCS85SW-SC3	Software subscription for LCS85 software, three years
MS-15KUPG-0	Software upgrade license for support of additional 15,000 objects
SC450RM1U (OEM Part No.)	Recommended UPS for LCS85: APC Smart-UPS SC 450 VA, 280 A 120 VAC input/output with NEMA 5-15R output connections
MS-EXPORT-0	License to enable the <i>Metasys</i> Export Utility software for new installations or projects
MS-COPY-LCS85SW	DVD copy of unlicensed LCS85 software

❶ **Note:** MS-EXPORT-0 is a stand-alone product. For more information, refer to the *Metasys System Software Purchase Options Product Bulletin (LIT-12011703)*.

Table 2 lists part numbers for ordering Loytec L-IP routers. Loytec L-IP routers are not included in the LCS85 product offering and are ordered separately. Loytec's Embedded IP-852 Configuration Server is recommended, but not required. If more than one Loytec L-IP router is used, only one needs to have the IP-852 Configuration Server enabled. If you do not use Loytec's IP-852 Configuration Server, then you must use Echelon's IP-852 Configuration Server. No other IP-852 Configuration Servers are approved for use with the LCS85.

Table 2: Loytec L-IP Routers Ordering Information

Product Code Number	Description
LIP-3ECTB	Router with 1 FTT10 channel and Embedded IP-852 Configuration Server
LIP-33ECTB	Router with 2 FTT10 channels and Embedded IP-852 Configuration Server
LIP-3333ECTB	Router with 4 FTT10 channels and Embedded IP-852 Configuration Server

❶ **Note:** The LIP-3ECTB is the preferred Loytec L-IP router for use with the LCS85.

Table 3 lists ordering codes for other routers compatible with the LCS85. You can use these devices to route the LonWorks field networks, but you cannot use them as the Configuration Server. Contact your nearest Johnson Controls® representative to order.

Table 3: LCS85 Compatible Router Ordering Information

Product Code Number	Description
Echelon Products	
LN-72101R-400 ¹	i.LON SmartServer FT
LN-72102R-400 ¹	i.LON SmartServer FT with Modem
LN-72101R-408	i.LON SmartServer FT with IP-852 Routing LN-72101R-408
LN-72102R-408	i.LON SmartServer FT with IP-852 Routing and Modem
LN-72101R-409 ¹	i.LON SmartServer FT with Programmability
LN-72102R-409 ¹	i.LON SmartServer FT with Programmability and Modem
LN-72101R-410	i.LON SmartServer FT with IP-852 Routing and Programmability
LN-72102R-410	i.LON SmartServer FT with IP-852 Routing, Modem, and Programmability
LN-72102-308	i.LON 100 E3 FT with Modem and IP-852 Routing
LN-72650R	i.LON 600 and MPR-50 Multi-Port Router Bundle
72601	i.LON 600 Server TP/FT-10CH90
72603	i.LON 600 Server TP/FT-10CH24
72160	Optional IP-852 Router Activation Key
Adept Systems Products	
GR4A-EFNNI	GRouter4 ² with Ethernet, FTT-10 Transceiver, No Internal FT Terminator, Screw Terminal Blocks
GR4A-EFTNI	GRouter4 ² with Ethernet, FTT-10 Transceiver, Internal FT Terminator, Screw Terminal Blocks
GR4A-EFNPI	GRouter4 ² with Ethernet, FTT-10 Transceiver, No Internal FT Terminator, Pluggable Terminal Blocks
GR4A-EFTPI	GRouter4 ² with Ethernet, FTT-10 Transceiver, Internal FT Terminator, Pluggable Terminal Blocks
CNS Products	
CNSNeNode IV/1/1/1/1	eNode™ LON/IP Router ²

- 1 The Optional IP-852 Router Activation Key (code no. 72160) is required for LCS85 server compatibility because these devices do not have IP-852 routing capability pre-installed. You must purchase code no. 72160 with this model.
- 2 Requires 5 VDC power supply and must have firmware version 4.10.038 or better.

LCS85 Technical Specifications

Table 4: LCS85 Software System Recommendations for Installation/Upgrade

Recommended Computer Platform	Intel Xeon E5506, 2.13 GHz, 4 MB Cache 2 x 160 GB 7.2K SATA, 8.9 cm (3.5 in.) Cabled 3 Gbps, RAID 1 configuration with add-in SAS6/iR (SATA/SAS Controller)
Recommended Memory	8 GB RAM minimum
Hard Disk	160 GB minimum
Supported Operating Systems and Software	- Windows® Server® 2016 (64-bit) - Windows® Server® 2012 R2 with Update 1 (64-bit) - Windows® Server® 2012 (64-bit) ① Note: Microsoft .NET Framework 3.5 Service Pack (SP) 1 and Microsoft .NET Framework 4.6.1 are required for LCS85 software.
Internal Optical Drive	DVD ROM, SATA
Supported Web Browser Software for <i>Metasys</i> Site Management Portal Client Computers	Windows® Internet Explorer® 11.0.9600.18816 Update version 11.0.47 or later ① Note: In Internet Explorer 11, select the Use Microsoft compatibility lists option, found under Tools > Compatibility View Settings, to ensure that websites appear and function correctly. Google® Chrome™ version 61 or later Apple® Safari® 11 or later Other browsers, such as Mozilla® Firefox®, may also be used but are not fully supported.
Supported Virtual Environments	Microsoft Hyper-V™, VMWare®
Network Communication	Selectable Network Interface (if computer has multiple network cards, during LCS85 installation, select the network card that was configured for <i>Metasys</i> system use before installation) Ethernet network interface card 10/100/1000 Mbps (100 Mbps or better recommended)
Recommended Data Protection	Uninterruptible power supply (UPS) Smart-UPS SC 450VA, 280 W, 120 VAC input/output, NEMA 5-15R output connections, OEM Part No. SC450RM1U

Points of single contact

APAC	Europe	NA/SA
JOHNSON CONTROLS	JOHNSON CONTROLS	JOHNSON CONTROLS
C/O CONTROLS PRODUCT MANAGEMENT	WESTENDHOF 3	507 E MICHIGAN ST
NO. 32 CHANGJIJANG RD NEW DISTRICT	45143 ESSEN	MILWAUKEE WI 53202
WUXI JIANGSU PROVINCE 214028	GERMANY	USA
CHINA		

North American Emissions Compliance

Canada

This Class (A) digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe (A) respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

United States

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the users will be required to correct the interference at their own expense.

