

Specification Sheet

LFC7731, LFC7732, LFC7733, LFC7734, and LFC7735

The Segment Control Unit is the central processing unit (CPU) in the cabinet system. Equipped with a more powerful ARM Cortex A7 (1.3 GHz) processor and a Linux kernel. It supports 2G, 3G and 4G modes of communication.

Commonly used interfaces for energy meter, load current and leakage measurement, relays for contactor mains switching are integrated into the Segment Control Unit for ease of wiring and compactness.

Direct communication between the optional modules takes place by means of an A-Bus interface, which is based on industrially proven RS485 technology.

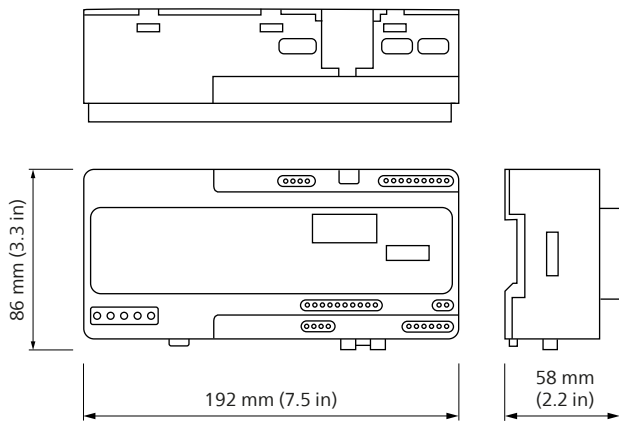
LFC7731, LFC7732, LFC7733, LFC7734, and LLC7735

The Segment Control Unit serves as a communications and data concentrator module. Two-way communication with the central server takes place via Ethernet, GPRS (3G/2G/4G) or SMS. The module can automatically switch between different available communications carriers to provide stable and reliable communication.

Data is either delivered to the server immediately or stored locally in the built-in flash memory of the Segment Control Unit until scheduled delivery. Software and configurations are updated remotely from the server and stored on the Segment Control Unit enabling it to autonomously execute tasks, for example, turn the streetlight on/off or collect meter readings based on the configurations set up by the user.

Voltage values on all three phases of the main supply are monitored by the Segment Control Unit. If the module is installed together with a Battery1 module, the Segment Control Unit will be supplied with backup power via the A-Bus in the event of power failure. This enables the Segment Control Unit to store data and send a main power failure alarm to the central server before it shuts down safely. For more detailed information, see the specific module manuals and guides.

Dimensional drawing



A Warning

FIRE HAZARD. If the temperature of the battery gets higher than the specified highest temperature range listed in the battery specifications, there is a potential risk of overheating and/or fire. To reduce this risk, please ensure that you use the product in accordance with the specifications provided, and do not expose it to extreme temperatures. If you notice the temperature of the battery getting higher than usual, please stop using the product immediately. Signify cannot be held responsible for any damage or injury caused by use of this product outside the specifications.

Applications

The Segment Control Unit is a power grid monitoring and group lighting control device used for remote monitoring and control of outdoor lights.

It is designed to be installed inside an IP65-rated outdoor cabinet. This control unit is designed as a local controller for group light controls, as in road and street, expressways, recreational sports lighting, premises/campus area lighting, public parks or in tunnel lighting applications.

For remote connectivity, a 2G/3G/4G network can be used or Ethernet connectivity (depending on application, firmware, and security). The accurate current measurement can help to detect power thefts when the current value goes beyond a threshold limit defined.

The inbuilt GPS locator helps to detect the location of the installed controller remotely to enable ease of commissioning.



Connect Coded Mains modules via DALI to deploy dimming of a group of lights with a unique, patented technology. Coded Mains broadcasts the dimming information over mains wiring to a set of LED luminaires with a Coded Mains-enabled driver, or 1-10 or DALI drivers with a Coded Mains receiver in a cost-effective and reliable way. It overcomes all issues of conventional voltage step dimming and two-way powerline communication.

The DALI interface controls other DALI-enabled devices like a group of luminaires in a high mast pole in an airport or port applications with dimming capability. The wide operating voltage range from 120-277 V makes the controller usable in a wide range of geographical locations. The use of an external surge protection module is highly recommended to protect the Segment Control Unit from surges.

You can connect up to ten Coded Mains modules to an SCU.

In general, the Segment Control Unit can be used for remote light management in diverse outdoor lighting applications.

Functional specifications

Primary	
Power	L1, L2, L3,  , N
Three mains rated phase (line) inputs	L1/L2/L3
Mains-related alarm monitor input or cabinet door alarm	1 
One mains neutral input	N

The Segment Control Unit can be mains powered by one, two, or three phases plus neutral. When powered by multiple phases, the Segment Control Unit can detect phase faults on the mains power supply.

If a fault occurs on one or two phases, the Segment Control Unit will still be powered by the remaining phase(s). In this case, the Segment Control Unit will send an alarm to the central server.

The alarm monitor is a mains-rated input (w.r.t. mains Neutral (N)) for cabinet door monitoring.

Interfaces

USB	2x USB 2.0 host port for additional devices.
Analog	2x Low voltage measurement inputs analog input 1 and analog input 2 (positive voltage w.r.t. GND).
Digital	1x Low voltage input digital input (positive voltage w.r.t. GND).
Ethernet	RJ-45 connector, 100/10 Mbps, half and full duplex, functional insulated from the secondary connections.
GPS	SMA connector for external GPS antenna.
2G/3G/4G	SMA connector (female) for external 2G/3G/4G antenna
SIM card	Micro SIM Card slot is available on top part of the Segment Control Unit.

A-Bus	1x 5 internally connected signals that are used for the A-Bus. The internal connection makes it easier to daisy-chain to other controller modules.
RS485	Supports multiple baud rates. Default value is 9,600 bps.
DALI	DALI master without DALI Power Supply.
Current sensing	Phase current sensing and leakage current sensing.
RS232 interface	For use with RS232 power meters, maximum data transfer rate 115.2 Kbps.
GPS antenna	Insert the antenna in the antenna socket of the Segment Control Unit and tighten it gently with your fingers. Do not use tools. Hot wiring is not allowed as it will damage the input!
2G/3G/4G antenna	Insert the antenna in the antenna socket of the Segment Control Unit and tighten it gently with your fingers. Do not use tools
Status LEDs	Green: COM (Communication mode) Orange: GPS (GPS location status) Red: SCU (Overall system health)

Reliability and Maintainability

Software upgrade/installation	The software on the Segment Control Unit can be updated remotely from the central server. New software is transferred without interrupting the normal functionality of the Segment Control Unit. When the software has been transferred, the integrity of the software is checked, and the software is installed.
Multi-layer system	Various internal processes ensure that the system is up and running at all times.
System health	In case a process has failed, it is restarted without disturbing other processes.
Self-test	A built-in self-test is performed after power-up.

Installation

The Segment Control Unit should be protected from dust and water, preferably by enclosing the system in a metal IP class 65 (NEMA type 4) outdoor cabinet.

Connections on the primary side

Keep wiring short from the mains circuit breaker towards the mains power input.

When using a surge protection module, the wires between the surge protection module and the Segment Control Unit may not exceed 0.15 m.

Signify recommends using a surge protection module for outdoor applications.

A Caution

Disconnect the power supply of the cabinet before any work on wiring connections or during maintenance of the lighting system.

Connections on the secondary side

All cables on the secondary side should preferably be shielded, with the shield connected to GND (pin 5 for the A-Bus)

EU directives	Use shielded twisted pair (2x2) cable. The Segment Control Unit can be connected to any client module, for example, RS485 module, Switch module. Double connections on the A-Bus makes daisy-chaining of the signals easy. For detailed information, see wiring diagrams.
A-Bus cable	cable length < 3 m
RS485	cable length < 1,000 m
Analog/Digital Input	cable length < 3 m
Current Sensing Input	cable length < 3 m
DALI	cable length < 10 m
USB	cable length < 3 m
RS232	cable length < 3 m
Ethernet	cable length < 3 m
Mains Input	cable length < 1.5 m

Connections

Mains power connector	0.82 to 1.5 mm ² (18 to 14 AWG) solid/stranded; copper conductors only, wire rating 65 °C (149 °F) min.; wire strip length: 8 to 9 mm (0.31 to 0.35 in); tightening torque: 0.40 to 0.50 Nm (0.30 to 0.37 ft-lb).
Analog/Digital input, A-Bus, RS485, RS232, Current sensing connectors	0.14 to 0.5 mm ² (26 to 20 AWG) solid/stranded; wire strip length: 5 mm (0.2 in); tightening torque: 0.20 to 0.24 Nm.
DALI connectors	0.14 to 0.5 mm ² (26 to 20 AWG) solid/stranded; wire strip length: 5 mm (0.2 in); tightening torque: 0.15 to 0.20 Nm.
Relay connector	0.82 to 1.5 mm ² (18 to 14 AWG) solid/stranded; wire strip length: 6 mm (0.24 in); tightening torque: 0.40 to 0.44 Nm.
Ethernet	Tab-Down RJ-45 meets IEEE 802.3 Standard with minimum of 1,500 Vrms isolation.
USB	USB 2.0 Type-A receptacle.
2G/3G/4G	Antenna SMA female; Impedance 50 Ω, Tightening torque: max 0.5 Nm (0.37 ft-lb).
GPS Antenna	RPSMA female; Impedance 50 Ω, Tightening torque: max 0.5 Nm (0.37 ft-lb).

Technical specifications

Mechanical	
Top part	Polycarbonate Light Gray (RAL 7035)
Base part	Polycarbonate Light Gray (RAL 7035)
Coating	PCBA with permanent coating
Mounting	DIN-rail (EN50022)
Weight	385 g (13.6 oz)
Dimension (l x w x h)	192 x 86 x 58 mm (7.56 x 3.39 x 2.28 in)
Environmental conditions	
Operating temperature (T _a)	-20 to 60 °C
Storage temperature	-40 to 85 °C
Humidity	20 to 90% non-condensing
Power Supply	
Rated Input Voltage	220 – 240 Vac (3P + N)
Nominal voltage	230 Vac
Operational input range	120 – 277 Vac
Frequency	50 to 60 Hz
Relay Endurance on given maximum of 100,000 operations. COM1, NO 1 750 VA COM1, NC 1 750 VA COM2, NO 2 750 VA	Max switching voltage: Rated 250 V; Performance Range: 120 to 277 V. Max switching current: 3A (resistive load), 0.75 A (inductive load, such as contactor).
Power consumption	< 3 W, Segment Control Unit only, no load on A-Bus and USB.
Nominal power consumption	< 5.5 W, Segment Control Unit with one Switch module, one Current module and one Battery module.
Maximum system power consumption	< 18 W, Segment Control Unit and 460 mA on A-Bus and each 250 mA on 2x USB.
USB	Maximum 250 mA, 5V
Current consumption (powered via A-Bus)	Typical 100 mA, Max 300 mA at 12V

Robustness and reliability	
Operational lifetime	70,000 hrs
Lifetime failure rate	10.0%
Measurement characteristics	
Input mains	Accuracy within 120 - 277 Vac range: ± 5% FSD (Full Scale Deflection).
Analog input	Input range 0-10 V, 4-20 mA (0-20 mA): Impedance = 510 Ω (DC) Accuracy = ± 2% FSD at 25 °C. When used as digital input: Threshold of approximately 1 V. Absolute maximum input voltage = 12 V (A-Bus voltage can be used).
Digital input	Internal 100 KΩ resistor: 1 MΩ pull-up resistor. Connect terminal to GND for a digital low. Make sure that the terminal to GND resistance is below 1 KΩ (current internally limited to 3 μA). Keep wires connected to this high impedance input away from disturbing networks.
Leakage Sensor	Leakage sensor input detection range: 170 – 1000 mA. Use with LCU7591 Leak coil only. Input range: 5 – 15 mA (including = 5 mA), abs. accuracy ± 5% FSD; 1-5 mA, abs. accuracy ± 10% FSD
Current Sense	Current sensor input(s) Detection range: 5 – 65 A. Use with LCU7590 3-Phase Coil only. Input range: 5 – 100 mA (including = 5 mA), abs. accuracy ± 5% FSD; 1-5 mA, abs. accuracy ± 10% FSD
GSM/GPRS/EDGE	
Bands	E-GSM 900, DCS 1800
Conducted Transmit Max output power	E-GSM 900: <ul style="list-style-type: none"> • 31-34 dBm; GMSK mode (Class 4; 2 W, 33 dBm). • 24.5-29.5dBm; 8PSK mode (Class E2; 0.5 W, 27 dBm). DCS 1800: <ul style="list-style-type: none"> • 28-31 dBm; GMSK mode (Class 1; 1 W, 30 dBm). • 23.5-28.5 dBm; 8 PSK mode (Class E2; 0.4 W, 26 dBm).

GPRS	<ul style="list-style-type: none"> DTM (simple class A) operation. GPRS Multislot class 10 (no backoff) <ul style="list-style-type: none"> Four Rx slots (maximum), two Tx slots (maximum), five active slots total. Coding schemes CS1, CS2, CS3, and CS4. GEA1, GEA2, and GEA3. ciphering. WCDMA/GERAN system selection. 	WCDMA	
EDGE	<ul style="list-style-type: none"> E2 power class for 8 PSK. DTM (simple Class A), Multislot class 12. EGPRS – Multislot class 12 (with backoff). BEP reporting. SRB loopback and test modes A and B. 8-bit and 11-bit RACH. Support PBCCH. One-phase/two-phase access procedures. Link adaptation and IR. NACC, extended UL TBF. Support PFC/PFI (Packet Flow context/Packet Flow identifier). GPRS/EDGE MSC 12-EDA – permits allocation of more than two uplink timeslots for GPRS/EDGE. Enh DL RLC/MAC. Segmentation – permits reception of MAC control messages that exceed one radio block capacity in length. Enhanced Ext UL TBF – dummy block transmission is punctured for current saving purposes. 2G PS handover – packet-switched equivalent of CS handover to ensure faster cell change and improved throughput. 		
SMS	SMS MO and MT. CS and PS support. SMS saving and reading from UIM card or ME storage.		
SIM card	Support Micro SIM card. Micro SIM card is inserted in the SIM slot at the top part of the Segment Control Unit.		
SD Card	Micro SD card is inserted on top part of the Segment Control Unit.		
GNSS	RPSMA connector for external GNSS antenna. GPS (1575.42 ± 1.023 MHz).		
		Bands	<ul style="list-style-type: none"> LFC7731, LFC7734, and LFC7735 (WP7607-1): B1, B8 LFC7732 (WP7608-1): B1, B8 LFC7733 (WP7609): B1, B5, B8
		Conducted Maximum Transmit power	<ul style="list-style-type: none"> LFC7731, LFC7734, and LFC7735 (WP7607-1): 21.5-24 dBm; Power Class 3 bis LFC7732 (WP7608-1): 22-25 dBm; Power class 3. LFC7733 (WP7609): 21.5-24 dBm; Power class 3 bis.
		WCDMA R99	All modes and data rates for WCDMA FDD. PS data rates of 384 kbps DL and 384 kbps UL.
		WCDMA R8 HSDPA	<ul style="list-style-type: none"> PS data speeds up to 42 Mbps (UE category 24) on the downlink. HS-DSCH (HS-SCCH, HS-PDSCH and HS-DPCCH). Maximum of 15 HS-PDSCH channels, both QPSK and 16 QAM modulation. Support for 3GPP-defined features. Switching between HS-PDSCH and DPCH channel resources, as directed by the network. STTD on both associated DPCH and HS-DSCH simultaneously. CLTD mode 1 on the DPCH when the HS-PDSCH is active. STTD on HS-SCCH when STTD or CLTD mode 1 are configured on the associated DPCH. Support SCH-IC. Support HS-DSCH DRX.
		WCDMA R6 HSUPA	<ul style="list-style-type: none"> E-DCH data rates of up to 5.76 MB/s for 2 ms TTI (UE category 6) uplink. Support for 3GPP-defined features. STTD on all HSUPA downlink channels. CLTD mode 1 on HS-PDSCH and DPCH along with HSUPA channels. Switch between HSUPA channels and DPCH channel resources, as directed by network. Handover using compressed mode with simultaneous E-DCH and HS-DSCH interactive, background and streaming QOS classes. Support DPCCCH DTX.

LTE	
Conducted Tx Max output power	20.3 – 24 dBm; Power class 3 at all bands
LTE R13	eDRX (Extended Discontinuous Reception) to extend battery life in devices that do not require frequent network access.
LTE R10	<p>Release 10 mandatory LTE Features</p> <ul style="list-style-type: none"> • Data rates: Cat1 FDD (up to 10 Mbps downlink, 5 Mbps uplink); Cat4 FDD (up to 150 Mbps downlink, 50 Mbps uplink) 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, and 20 MHz RF bandwidth. • IPv6, QoS. • Inter-RAT capabilities with HSPA+ (WP7609 only). • NAS & PPC standalone security • Commercial Mobile Alert System (CMAS). • ETWS (Earthquake Tsunami Warning System) notification. • Inter-frequency/bandwidth mobility • DRX cycle while in Connected mode/Idle mode. • UE IART support for Self-Organizing Networks and Automatic Neighbor Relation (SON AR). • Mode reselections: LTE ↔ GERAN Idle mode mobility (cell reselection); LTE ↔ UMTS Idle mode mobility (cell reselection). <p>Mode redirections:</p> <ul style="list-style-type: none"> • UMTS to LTE redirections; • GERAN to LTE redirections; • LTE to UMTS redirections. <ul style="list-style-type: none"> • LTE to UMTS PS Handover. • LTE/GW Data Silent Redial for InterRAT. • Attach/detach PS during Voice Call or SMS • WCDMA fallback (WP7609 only)

LTE System Determination	<ul style="list-style-type: none"> • Frequency Scan and System Selection within LTE • LTE BPLMN support • LTE Connected mode OOS • System selection across RATs, Standalone Security, Dedicated EPS Bearer Management and Dormancy. • System selection across LTE, UMTS (WP7609 only), Green 256 UPLMN and 256 OPLMN entries in UIM support Carrier Specific BSR Requirements.
LTE Data	<ul style="list-style-type: none"> • Data call throttling. • Default IPv4 bearer activation at attach/IPv4 data call. • NW and UE initiated QoS. • Dual IP and IPv4/IPv6 continuity. • IPv4/IPv6 session continuity. • W/G IP Session continuity. • Emergency services- LTE NAS Support for Control Plane LTE Positioning Protocol.
LTE bands	
LFC7731/00	Cat1: B1, B3, B8, B20, B28
LFC7732/00	Cat1: B1, B3, B5, B8, B40, B41
LFC7733/00	Cat4: B1, B3, B5, B8, B28
LFC7734/00	Cat1: B1, B3, B8, B20, B28
LFC7735/00	Cat1: B1, B3, B8, B20, B28

Safety and EMC		ETSI EN 301489-19 V2.2.0	Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band (ROGNSS) providing positioning, navigation, and timing data; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.
The product is classified as Information Technology Equipment.			
Safety		ETSI EN 301489-52 V1.1.2	Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.
EC62368-1	(Safety) Audio/video, information, and communication technology equipment.		
AS/NZS 62368-1:2022	Audio/video, information, and communication technology equipment – Part 1: Safety requirements. Note: LFC7733 only.	ETSI EN 301511 V12.5.1	Global System for Mobile communication (GSM); Mobile Stations (MS) equipment; Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.
EMC (Immunity and Emission)		ETSI EN 301908-1 V13.1.1	IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 1: Introduction and common requirements.
CISPR 32 (EMI - Emission)	Electromagnetic compatibility of multimedia equipment – Emission requirements	ETSI EN 301908-2 V13.1.1	IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU; Part 2: CDMA Direct Spread (UTRA FDD) User Equipment (UE).
CISPR 35 (EMS – Immunity)	Electromagnetic compatibility of multimedia equipment - Immunity requirements.	ETSI EN 301908-13 V13.1.1	IMT cellular networks; Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU; Part13: Evolved Universal Terrestrial Radio Access (E-UTRA) User Equipment (UE).
EN IEC 61000-6-2 (2019)	Electromagnetic compatibility (EMC). Part 6-2: Generic standards. Immunity standard for industrial environments		
EN IEC 61000-6-3 (2019)	Electromagnetic compatibility (EMC). Part 6-3: Generic standards. Emission standard for equipment in residential environments.		
EN IEC 61000-6-4 (2019)	Electromagnetic compatibility (EMC). Part 6-4: Generic standards. Emission standard for industrial environments.		
RF Exposure	EN IEC 62311 AS/NZS 2772.2:2016+A1:2018		
RED			
ETSI EN 301489-1 V2.2.3	Electro Magnetic Compatibility (EMC) standard for radio equipment and services; Part1: common technical requirements; Harmonized Standard for Electro Magnetic Compatibility.		

ETSI EN 303413 V1.1.1	Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.
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Sustainability	
RoHS directive	2011/65/EC
Hazardous substances	RoHS Directive 2011/65/EU, as amended by Directive (EU)2017/2102 of November 2017.
Chemical substances	REACH Directive 2006/1907/EC
Electronic waste	WEEE Directive 2012/19/EU



* LFC7733 only

Adhere to RED Compliance guidelines of 2022/30/EU and the adoption of EN 18031: 2024

Packing data

Type	Box dimensions (mm)	Qty/Box	Material	Box Weight (kg)	
				net	gross
LFC7731/00 Segment Control Unit LTE 1	711 x 581 x 159	20	Cardboard	7.7	10.7
LFC7732/00 Segment Control Unit LTE 2	711 x 581 x 159	20	Cardboard	7.7	10.7
LFC7733/00 Segment Control Unit LTE 3	711 x 581 x 159	20	Cardboard	7.7	10.7
LFC7734/00 Segment Control Unit LTE 1 SIM	711 x 581 x 159	20	Cardboard	7.7	10.7
LFC7735/00 Segment Control Unit LTE 2 SIM	711 x 581 x 159	20	Cardboard	7.7	10.7

Ordering Data

Type	MOQ	Ordering number	EAN code level 1	EAN code level 3	EOC
LFC7731/00 Segment Control Unit LTE 1	1	9137 010 65803	8720169 210493	8720169 210509	210493
LFC7732/00 Segment Control Unit LTE 2	1	9137 010 65903	8720169 210516	8720169 210523	210516
LFC7733/00 Segment Control Unit LTE 3	1	9137 010 66003	8720169 210530	8720169 210547	210530
LFC7734/00 Segment Control Unit LTE 1 SIM**	1	9137 010 66103	8720169 210554	8720169 210561	210554
LFC7735/00 Segment Control Unit LTE 2 SIM**	1	9137 010 74703	8721103 056726	8721103 056733	056726

**LFC7734/00 Pre-installed SIM inside

**LFC7735/00 can connect with IAC-Group Management only

Data

For information on Data generation, access, use and related topics as required per the EU Data Act, please see our Generic Data Notice at: <https://www.signify.com/global/legal/digital-terms/datanotices/en> and the Specific Data Notice for this product with the Signify Interact City app, Signify AmpLight app, and Signify Interact Sports Recreational app that has been made available to you and/or can be requested at <https://www.signify.com/global/contact>.

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