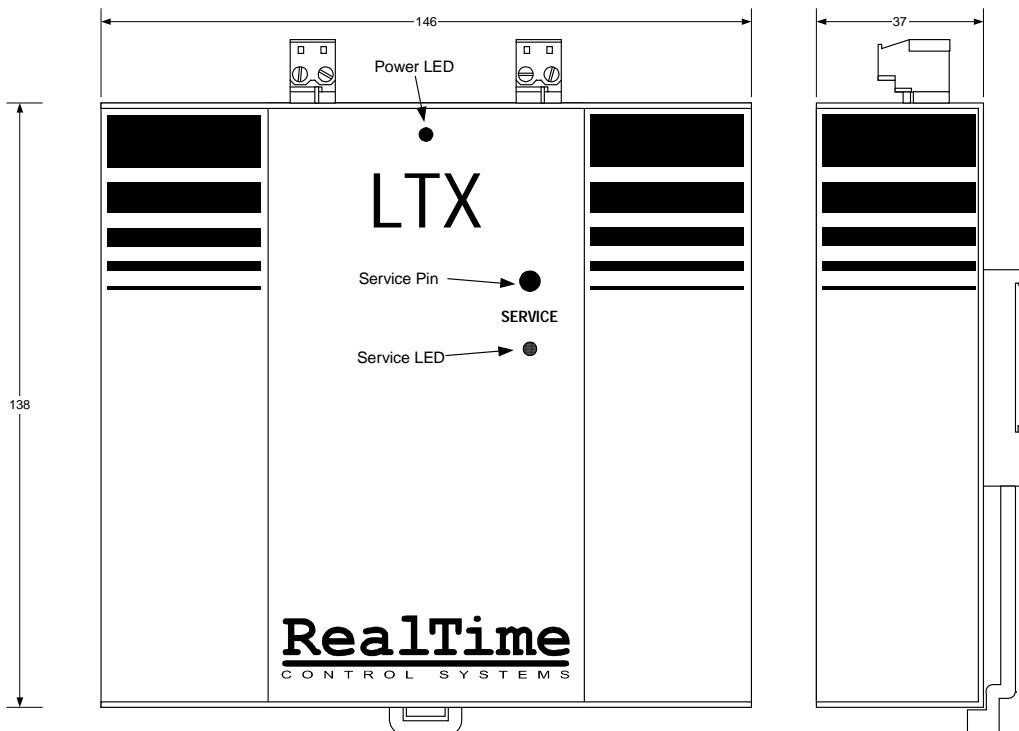


**LTX-21 BMS Gateway for
Toshiba air-conditioning units**



Description

The LTX-21 provides the necessary functionality for integrating R22 and R407C Toshiba RAV range air-conditioning units with the UK's leading BMS manufacturers products. The gateway removes the need for hardwired connections to BMS input and outputs and replaces them with a networked connection. All functionality available using hardwired inputs is available, in addition specific fault-codes from the Toshiba system are reported as BMS alarms and can be received by any connected BMS supervisor either on site or remotely. Furthermore the return-air temperature from each unit is also fed back for control and monitoring purposes. The gateway can handle up to 16 independent zones, removing the need for up to 80 hardwired i/o points on the BMS, and can report fault codes from each of the indoor units connected.



Dimensions (mm)

LTX-21 Iss2.10

New features - LTX-21 Issue 2.10

- Handles two LG1 interfaces to handle modular multi systems
- Unit readback data available in engineering
- Software controlled Master/Slave Grouping under both BMS and Keypad control
- Remote reset of units locked out by critical stopping faults.
- Options for Common alarm or individual unit fault reporting
- Heartbeat and Common fault feedback to BMS
- Compatible with Cooling-only and R22 RAV systems using the RealTime LRC-LG

LTX-21 Features

- Direct integration with existing control strategy
- Independent control of up to 16 air-conditioning units
- No hardwiring required
- BMS alarm reporting of fault codes for each of the 16 indoor units and attached outdoor units.
- Programmable default operating conditions
- Feedback of measured temperatures from each indoor unit – no need for separate space temperature sensors
- Co-ordinated BMS and local user control with keypad lockout facilities
- Compatible with UK leading BMS control system

System Description

The LTX-21 integrates Toshiba R407C RAV Heat-pumps into conventional BMS controls without the need for hardwired points. As illustrated in Figure 1 this integration is achieved by a combination of a RealTime LTX-21 and a Toshiba LG1. Connection to the host BMS is via the RJ-11 Supervisor port found on most controllers. For correct functionality the controller must have a 'network aware' supervisor port – consult the manufacturers literature to ensure that the selected controller has this capability.

The control of the air-conditioning equipment is achieved via the Toshiba LG1 interface, one of which is required for every 16 indoor units. Both the LTX-21 and Toshiba LG1 are based on

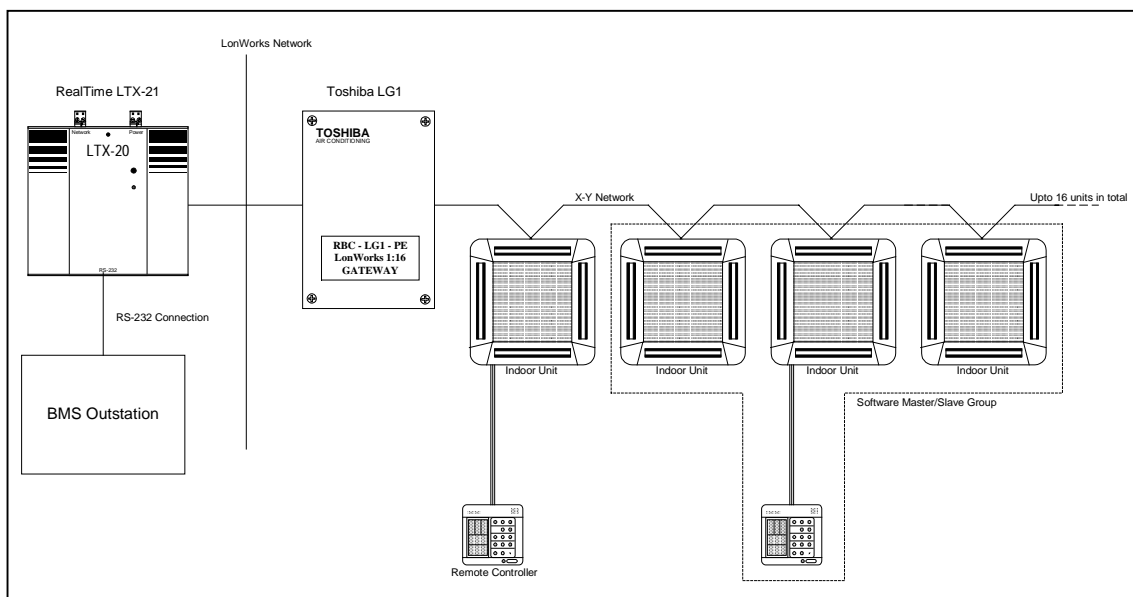


Figure 1. LTX-21 Topology

LonWorks® technology which allows the devices to be directly connected via a single free-topology network. In order to enable communications between the LTX-21 and the LG1 interfaces it is necessary to 'bind' the devices together using a suitable LonWorks Network Management tool. The LonWorks design and commissioning should be performed by a competent LonWorks engineer. An LTX-21 is required for each LG1 in the system. Once the initial network engineering has been performed the system can be configured and tested from either the LonWorks or the BMS side of the gateway.

Interfaces required for connecting to the LTX-21 are shown in the following table of Toshiba products.

	RAS - xxx	RAV - Heatpump	RAV – Cooling only
R22 – Series 0 to 3	X	<i>LRC-LG</i>	<i>LRC-LG</i>
R407C – Series 4	X	<i>Toshiba LG1</i>	<i>LG1/LRC-LG*</i>

*NOTE: Series 4 Cooling-Only *split* units do not have X-Y connections and are therefore not compatible with the LG1. However 'Cooling-only' units in VRF applications are actually 'heat-pump' indoor boards (with the -H) in the unit code, these are compatible with the LG1 as they have X-Y terminals.

The LTX-21 datasheet focuses on integration of the LTX-21 with the Toshiba LG1. For information about using the LRC-LG consult the datasheet available at www.realttime-controls.co.uk. **Note that temperature feedback is not available from the LRC-LG.**

Functionality

Each indoor unit requires the following information to be set to determine its operation.

- Setpoint
- Fan speed
- Run Mode
- Louver Control
- On/Off state

Values for these states are usually determined in the BMS control strategy according to time-of-day, external conditions etc.

The LTX-21 works by extracting these values from the analogue array of an outstation and converting them into *network variables* compatible with the LG1 LonWorks interface. The LG1 feeds back the return-air temperature, heat exchanger temperature and fault code from each unit. The measured temperatures can be sent to the outstation for monitoring and control purposes. Each zone can be independently mapped into a different part of the analogue array, allowing multiple 'soft' zones and the ability to rezone through software. The control can be split over two outstations if more complex control strategy is required.

The LTX-21 monitors the faults codes of each of the indoor units and if a unit enters a particular fault state a standard BMS alarm is generated which reports which unit is in alarm and the particular fault code. These codes are briefly summarised at the end of this datasheet. The fault-codes can be written into fields in the BMS outstation to allow the hexadecimal fault codes to be displayed on BMS supervisors. Decimal equivalents of the fault codes can also be written to the BMS to allow the control system to account for faulty units.

The LTX-21 also provides a 'fail-safe' mode of operation that places all of the air-conditioners in a user defined default mode should communications with the BMS fail for any reason.

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