

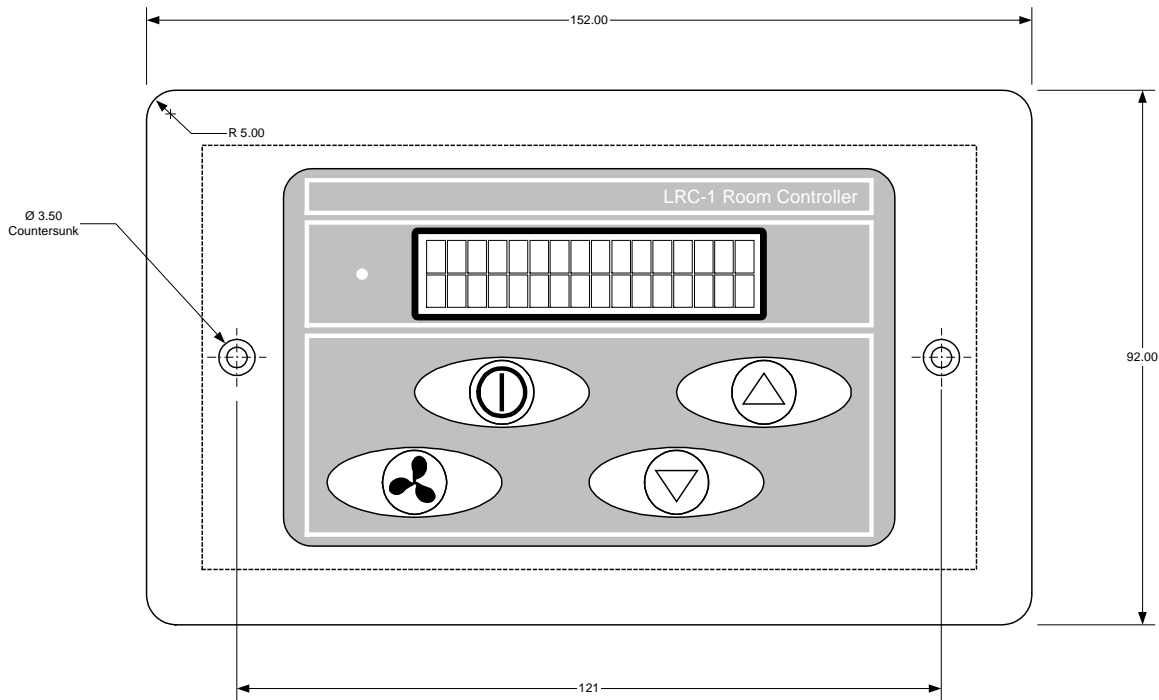
## LRC-XDP Display Panel for Toshiba air-conditioning units



### Description

The RealTime LRC-XDP is a monitoring panel compatible with the Toshiba LG1 air-conditioning control interface. The XDP displays the current operating settings and the temperatures and fault codes from all indoor units connected to the LG1. The XDP also makes available the temperatures and fault codes from the LG1 as LonWorks Standard Network Variables.

The LRC-1 user interface consists of a 4-button membrane keypad with a two-line backlit LCD display and stainless steel bezel surround. The controller mounts in a standard double-gang backbox allowing the device to be flush mounted in both solid and partition walls.



### Dimensions (mm)

## XDP Functionality

- Local Display panel for Toshiba LG1 interface
- Backlit LCD display and keypad interface
- Passive monitoring of LG1 when managed by other devices
- Active monitoring of LG1 in stand-alone mode
- Feedback of operating conditions, return air and heat exchanger temperatures and fault codes.
- Extraction of fault codes, return air and heat exchanger temperatures as individual Standard Network Variables.
- A panel LED is used to indicate at least one unit in fault.
- Compatible with RealTime LTX - LG1 interfaces.

## Description

The RealTime LRC-XDP is a monitoring panel compatible with the Toshiba LG1 air-conditioning control interface. The XDP displays the current operating settings and the temperatures and fault codes from all indoor units connected to the LG1. The XDP also makes available the temperatures and fault codes from the LG1 as LonWorks Standard Network Variables. The control buttons on the XDP allow the user to toggle the display view and to manually scroll through the unit settings. **Note that the XDP does not allow the user to change the unit settings.** As well as displaying individual unit faults, the XDP also indicates a fault condition with a flashing LED on the keypad - if at least one unit is in fault then the LED will flash, otherwise the LED will remain off.

## The XDP Display

On power-up or reset the XDP initially displays the following

```
RealTime LRC-XDP  
NO UNITS FOUND
```


The XDP will then monitor the LG1 until it receives unit data. Once data is received the XDP will cycle through the active units. The default state is to display the unit fault status and temperature feedback from the unit in the following format:

```
03:-- RA=22.50°C  
HE=-2.00°C
```

On the first line the unit number and fault code are displayed, followed by the Return Air (RA) temperature of the unit. On the second line the Heat-Exchanger (HE) temperature is displayed. If no fault exists then two dashes '—' will be displayed, otherwise the unit fault code will be displayed.

The display will cycle through all active units. After a power-up or reset it may take a few minutes before all of the units are discovered.

## Unit Settings Display

The display is toggled using the display mode key , which toggles between fault code and temperature display and unit settings display. The unit settings display has the following format:



```
03:ON F=LOW L=0  
M=COOL SP=19°C
```

On the first line is the unit number followed by the On/Off status of the unit. Following this is the fanspeed indicated by "F=xxx" where xxx is either LOW, MED, HI or AUT. Following this is the louver status indicated by either "L=0" (OFF) or "L=1" (ON).

On the second row the unit mode is indicated by "M=xxxx" where xxxx is one of AUTO, COOL, HEAT or FAN (for fan only). Following this is the setpoint of the unit indicated by "SP=xx" where xx is the setpoint in degrees centigrade.


If the view is left showing unit settings it will automatically revert to displaying the fault codes after 5 minutes.

## Display Cycling

The XDP will cycle through the active units automatically at a default rate of one unit every 1.5 seconds. This cycling can be stopped by pressing the scroll up  or scroll down  keys. Once cycling is stopped the user can manually step up or down through the units using these scroll keys. The XDP will revert to automatic cycling 1 minute after the last scroll key press.

The cycle rate can be changed by modifying the config network variable *nciCycleRate*, which defines the cycle rate in tenths of seconds. The default value is 15 – meaning 1.5 second cycle rate.

## Device Reset

Pressing and holding down the reset key  for at least 5 seconds will cause the XDP to reset and rediscover the units connected to the LG1. This can be used to clear 99 codes generate on units that no longer exist on the network.

## LonWorks Engineering

The XDP can be operated in two modes depending on how the LG1 is being used. The mode that the XDP is operated in is determined by whether the LG1 is being actively queried by another LonWorks device such as the RealTime LTX-21. If the LG1 is being actively queried then the XDP is used in *passive* mode in which it simply listens to the LG1 responses to the queries. If the LG1 is not being queried by another device then the XDP is used in *active* mode in which it actively queries the LG1. The XDP mode is set by the particular bindings that are used.

### XDP Passive Mode

In passive mode the XDP listens to the LG1 and the master device that is querying the LG1. The following bindings should be performed.

- 1) The *nvoQuery* from the Master should be bound to the XDP:*nviQuery* as well as the LG1:*nviQuery*
- 2) The LG1:*nvoIndoorData* should be bound to the XDP:*nviIndoorData* as well as the master.

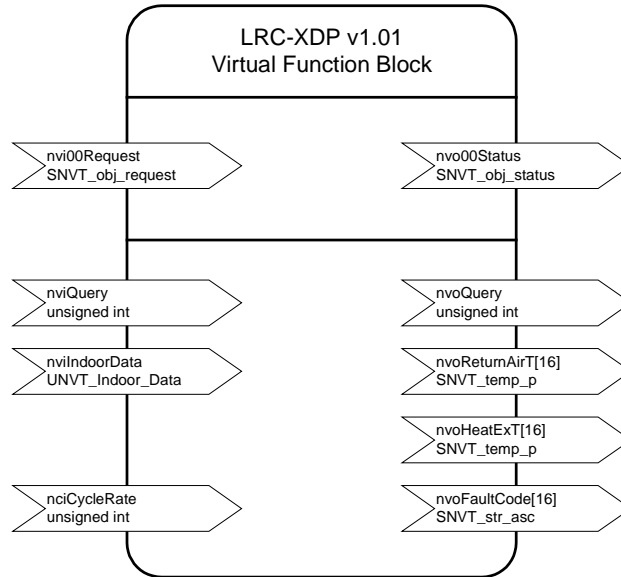
Note that the XDP will only pick up data from the units that are being queried by the master. In addition if the master is not regularly querying all units then the data displayed by the XDP will not be up to date.

### XDP Active Mode

In active mode the XDP sends queries to the LG1. In this situation no other device should be querying the LG1. The following bindings should be performed.

- 1) XDP:*nviQuery* should be bound to the LG1:*nviQuery*
- 2) The LG1:*nvoIndoorData* should be bound to the XDP:*nviIndoorData* as well as the master.

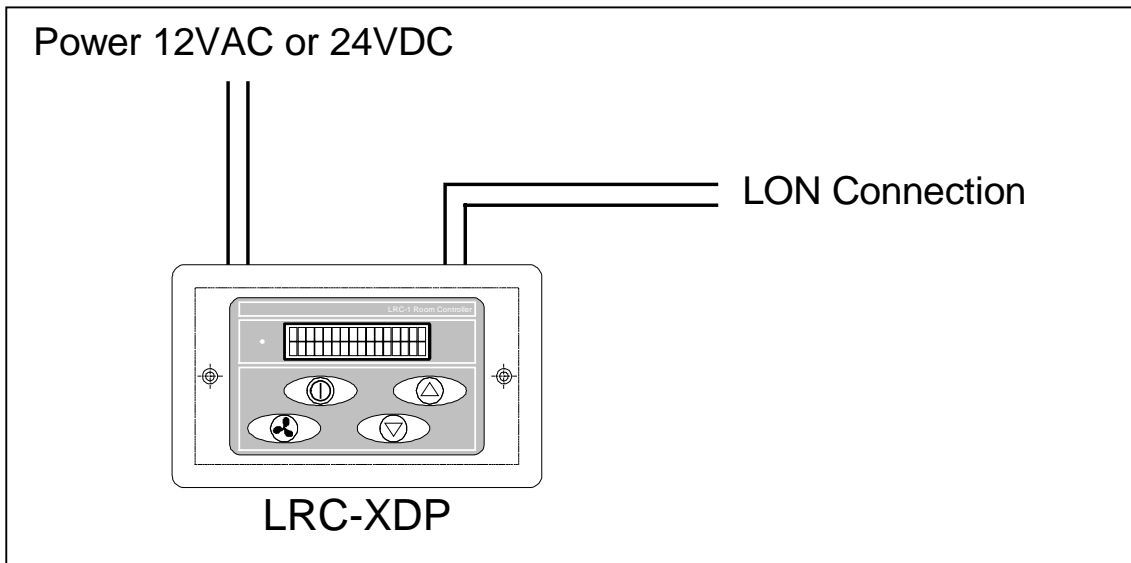
## LRC-XDP Functional Profile



The LRC-XDP functional profile is shown above. The following table gives a summary for each network variable.

NV#	Name	In/Out	Type	Description
0	nvi00Request	In	SNVT_temp_p	Standard Request
1	nvo00Status	Out	SNVT_switch	Standard Status
2	nciCycleRate	In	unsigned int	Display Cycle Rate tenth seconds
3	nviQuery	In	unsigned int	Passive Mode query monitor
4	nviIndoorData	In	UNVT_Indoor_Data	LG1 data
5	nvoQuery	Out	unsigned int	Active Mode query
6	nvoReturnAirT[16]	Out	SNVT_temp_p	Return Air Temperature Array
7	nvoHeatExT[16]	Out	SNVT_temp_p	Heat Exchanger Temp Array
8	nvoFaultCode[16]	Out	SNVT_str_asc	Unit fault codes Array

## Installation Instructions



### Flush Mounting

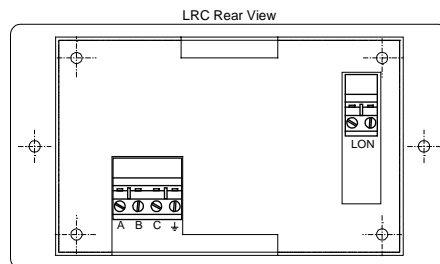
- 1) The LRC-XDP should be mounted in a standard double-gang dry-lining box with at least 35mm internal depth. It is possible to mount the LRC-XDP in a metal back-box but the box must be selected to ensure that the internal height of the box is at least 68mm and the depth is at least 35mm. Place the supplied stainless steel bezel over the front of the unit and fix in place using two countersunk M3.5 screws through the two mounting holes.
- 2) The LRC-XDP can be flush mounted through a panel door using two M3.5 screws and fastening at the back via two suitable washers and M3.5 nuts.

### Surface Mounting

- 3) The LRC-XDP can be mounted in a surface mounted double-gang box providing the internal depth of the box is at least 35mm. If the LRC-XDP is to be blanked off then fix a standard double gang blanking plate over the front using two countersunk M3.5 screws. Otherwise fix the supplied stainless steel bezel over the front and fasten using two countersunk M3.5 screws.

### Electrical Connections

- 4) The LRC-XDP is powered via the 4-way orange connector labelled A-B-C-Earth. For AC supplies the power is connected to **A-B**, do not connect anything to terminal **C**. For DC supplies connect the positive to Terminal **A**, connect the negative or 0V supply to the **Earth** terminal.



- 5) Connect the LonWorks network to the two way orange connector labelled 'LON' at the rear of the LRC-XDP. The connection is polarity independent. The wiring should be unshielded twisted pair.

## Technical Specification

### Electrical

<b>Supply</b>	12V AC or 24 VDC on AB connection
<b>Power</b>	1VA
<b>Processor</b>	Echelon 3120
<b>Clock Speed</b>	10 MHz
<b>LON Network</b>	FTT-10A Transceiver, Free topology network

### Environmental

<b>Temperature Storage</b>	-10oC to 50oC
<b>Operation</b>	0oC to 50oC
<b>Humidity</b>	0-90% RH non-condensing
<b>Protection</b>	IP30
<b>EMC Emissions</b>	EN50081-1
<b>EMC Immunity</b>	EN50082-1

### Mechanical

<b>Dimensions</b>	(all dimensions in mm)
<b>Bezel</b>	H97 x W152 x D5 5mm proud of flush mount Mounting holes 3.5 dia, countersunk 121mm apart
<b>Front Plate</b>	H76 x W136 Mounting holes 3.5 dia, 121mm apart
<b>Rear box</b>	H68 x W108 x D26 H68 x W108 x D30 with connectors
<b>Mounting</b>	Flush or surface mounted double gang box, min depth 35mm
<b>Bezel Material</b>	16 gauge Bright annealed stainless steel (standard option)
<b>Casing Material</b>	Zinc coated mild steel
<b>Weight</b>	200g
<b>ABC and LON Connectors</b>	Two part rising clamp 0.5mm <sup>2</sup> to 2.5mm <sup>2</sup> cross sectional area cable