

## Room Display



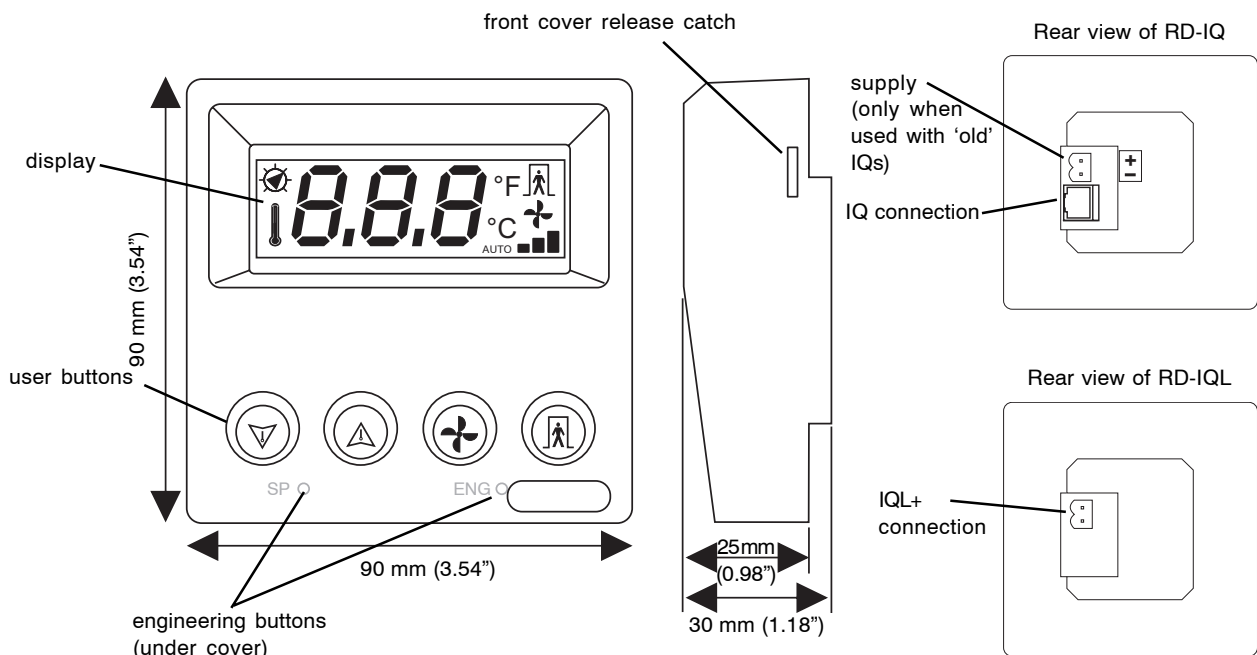
### Description

The Room Display is a temperature sensor and 3 digit display with control and indication of setpoint, and optional control and indication of fan speed and occupancy. There are IQ and IQL versions; the IQ version connects to the IQ controller by its local supervisor (RS232) port, and the IQL version connects to the IQL+ or IQLVAV controller by a digital (TBus) input. Both IQ and IQL versions can either be fitted on a standard electrical back box or be panel mounted.

### Features

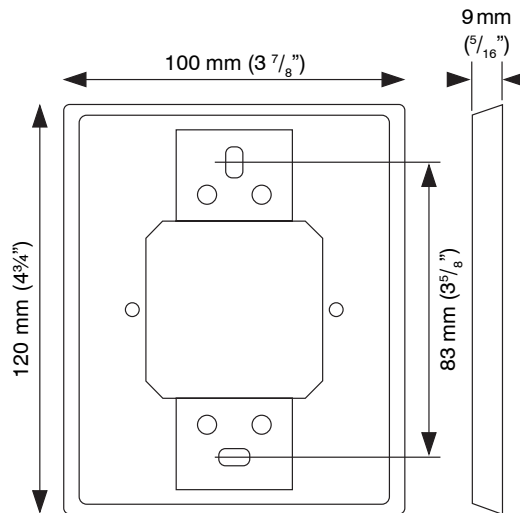
- Single power/signal connection to IQL+s, most IQ2xx, and IQ3
- Celsius or Fahrenheit display
- Icon indication of fan speed and occupancy states
- Digital display of local temperature or setpoint
- Adjustments configurable with 'out of box' default

### Physical



**Physical** (continued)

WSA Wall Sensor Adaptor Plate

**FUNCTIONALITY**

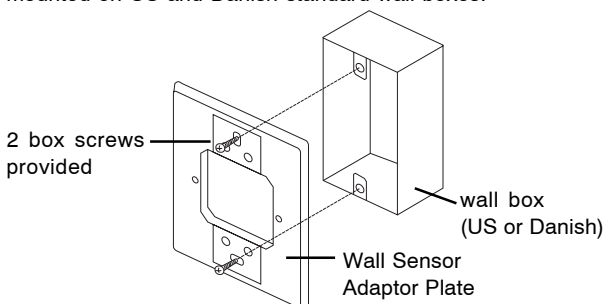
The RD Room Display senses the local temperature and displays it digitally in either °C or °F. It enables the setpoint to be displayed and adjusted locally. The appropriate versions also provide for the display and adjustment of fan speed (Off, Low, Medium, High, and Auto), and occupancy.

The unit consists of a main assembly and a clip-on front panel. It can be mounted on a standard electrical back box, or on the front of a panel. The RD-IQ/. range of units is for IQ controllers and the RD-IQL/. range of units is for IQL+ and IQLVAV controllers. An RD-IQ connects to an IQ controller by means of the local supervisor RS232 port. The IQ3 and most new IQ2xx series controllers supply the RD with power from this port. However, for early IQ21x, early IQ22x, IQ250, IQ251, and IQ1xx controllers, adapter cables are available to make use of the IQ controller's auxiliary supply. Alternatively, a separate 24 V (AC or DC) supply connector is available. The IQ module values displayed and controlled are set by default, but may be changed using a built-in engineering mode. An RD-IQL connects to an IQL+/IQLVAV controller by means of a digital (TBus) input. This two wire connection carries both signal and power for the RD. The IQL values displayed and controlled are fixed.

**HARDWARE**

**Unit:** The unit consists of a plastic electronics assembly with a plastic clip-on panel. The electronics assembly has two mounting holes to mount on a standard electrical back box or for screwing onto a front panel. Space must be left around the unit for airflow and access to remove the front panel.

The WSA, wall sensor adaptor plate, enables the RD to be mounted on US and Danish standard wall boxes.



It is supplied with 2 plate covers to cover up the fixings to the wall box, 2 wall box screws, and two 3.5 mm screws to fit the RD to the adaptor plate.

**Versions:** There are two main types, **RD-IQ**, and **RD-IQL**. Both of these types have the following variants:

**/K** :Thermistor and setpoint adjustment

**/KOS** :Thermistor, setpoint adjustment, occupation override, and occupation status display

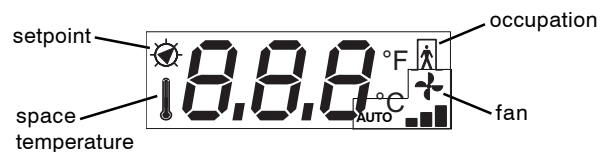
**/KOSF** :Thermistor, setpoint adjustment, occupation override, occupation status display, and fan speed control

These variants differ in that, only the buttons used for that particular variant have the icons printed on them, the unused buttons being left blank.

**Supply:** The RD-IQL is supplied from the IQL+ or IQLVAV. The RD-IQ requires 24 Vac or 24 Vdc at 10 mA. It can take its supply either from the RJ11 connector (if available on the IQ controller) or from a separate two part connector.

**Backup:** The engineering mode settings are stored in EEROM which is non-volatile to power interruptions.

**Display:** The custom LCD display is not backlit and contains 3 large digits, and the eleven icons:




**Digits:** In range 0.00 to 999. Normally displays either setpoint or temperature but also used to indicate errors. In engineering mode also used for setting module numbers, and PINs.

**Knob or Thermometer** : Indicates which (setpoint or local space temperature respectively) is being displayed. °C or °F : Indicates the temperature display units





**Unoccupied** or **Occupied** : Indicates the occupation state

**HARDWARE**

**Fan** : Indicates fan being controlled.

**AUTO**: Indicates fan in Auto

**Low** , **Medium** , or **High**  **speed**: Indicate manual fan speeds.

					AUTO
Off	on				
Low	on	on			
Medium	on	on	on		
High	on	on	on	on	
Auto	on				on

The fan icons operate together.

**Buttons**: The front panel has four user buttons accessible with the front panel fitted, and two additional (engineering) buttons accessible only with the front panel removed.

button 1    button 2    button 3    button 4











SP

ENG

SP button (not used)

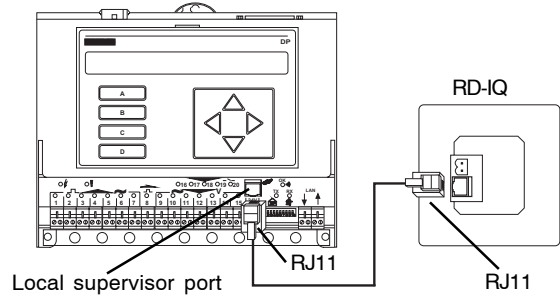
engineering button

The four user buttons are numbered 1 to 4 left to right, and labelled , , , and . The left engineering button (SP) is not used on the RD, and the right button (ENG) is used to select one of the engineering modes. The full use of the buttons is explained in the firmware section.

- Button 1, : This button is normally used to lower the setpoint
- Button 2, : This button is normally used to raise the setpoint
- Button 3, : Steps through the fan speed control levels
- Button 4, : Enables override of occupation

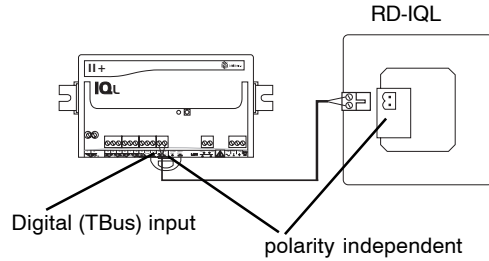
**Communication**: The RD-IQ connects the IQ local supervisor port (RS232). Connection to an IQ2xx is by an RJ11 to RJ11 cable. It communicates at 9k6 baud, 7 bits, odd parity. The IQ controller should have its local supervisor port CNC address set to zero for local connection, (not any other address, which implies network communication).

**RD-IQ**



The RD-IQL connects to a digital (TBus) input using two polarity independent wires. It connects to the first digital input, IN3 for IQL11+, IN4 for IQL13+ and IQL15+, IN5 for IQLVAV.


**RD-IQL**



## FIRMWARE


### Normal Operation


**Startup Reset:** The RD will perform a reset cycle when power is applied. It will first illuminate all the display segments, then turn them all off. This is followed by a display of the RD firmware version.

If the RD-IQ doesn't communicate successfully with the IQ, it will present the communications error display described below which, in this case, will consist of the empty occupation icon  and °C flashing continuously until communications succeed.



If the RD-IQL doesn't successfully communicate with the IQL+ it will repeat the startup reset cycle after 7 seconds and continue to repeat it until communications succeed.



**Data Transfer:** The unit will calculate a value from its thermistor every second. If the temperature is below -20 °C (-4 °F), the RD assumes that the thermistor is not fitted, and ignores the input.





**Illumination:** All 4 buttons of the RD-IQ are illuminated when the unit is in the 'wake' state. Button 4, , of the RD-IQL is illuminated to indicate that the IQL+ has K6, Remote Occ, set to Bypass; other RD-IQL buttons are not illuminated.




**Wake state:** The display will normally show local temperature . Pressing any button (1 to 4) will wake the unit and in RD-IQ will turn on the pushbutton lights. Ten seconds after the last button is pressed the unit will return to the "sleep" state and turn off the RD-IQ pushbutton lights.

In the "wake" state the buttons operate as follows:

Button 1, : Causes the display to show the setpoint  for 10 seconds, and pressing again lowers setpoint by 0.5 °C (if °C is selected for the display) or by 0.5 °F (if °F is selected for the display).






Button 2, : Causes the display to show the setpoint  for 10 seconds, and pressing again raises setpoint by 0.5 °C (if °C is selected for the display) or by 0.5 °F (if °F is selected for the display).

Button 3, : Steps through the fan speed control levels (off, low , medium , high , auto)

Button 4, : Enables override of occupation (unoccupied , occupied ).

*Note that the actual operation of the HVAC equipment in response to the RD buttons depends on the strategy configured in the controller.*

**Display:** The display mode is set to **local and setpoint** by default but may be changed to **setpoint** only in engineering mode (see Engineer Display Mode).

In local and setpoint mode, the display will normally show the thermometer symbol  and the value of space temperature. Pressing either button 1, , or 2, , in "wake" state will cause the display to show the knob symbol  and the setpoint (Ka). In setpoint mode, the knob symbol  is shown all the time along with the setpoint (Ka).

**Adjust Contrast:** The contrast can be adjusted for optimum by adjusting the signal level applied to the display driver. As the signal level is raised the display will go through optimum contrast depending on situation and temperature. Simultaneously pressing buttons 1 + 4 will raise the signal level and pressing 2 + 4 will decrease it. The optimum contrast can be found by using these two button combinations.

**For RD-IQ,** the value is written to the IQ controller by using a text comms write [e.g. Ka(V=x)]. The temperature is written in °C or °F depending on the option selected (see Engineer Display Options).

At the refresh interval (5s in "sleep" state, 2s in "wake" state), and after every button pressed in "wake" state, the RD makes a request to the IQ controller in text comms of the form [Sx(V), Ka(V), Kb(V), Kc(V)]. This requests the values of local temperature, setpoint, occupation status, and fan speed setting where:

Sx: Local space temperature sensor [default S9]

Ka: Setpoint knob [default K1]

Kb: Occupation status knob (0=Unoccupied, 1=Occupied) [default K6]

Kc: Fan speed knob (0=off, 1=Low, 2=Medium, 3=High, 4=Auto) [default K7]


These defaults may be changed in engineering mode (see EngineerCommunication).


**FIRMWARE** (continued)


For **RD-IQL**, the IQL+/IQLVAV polls the RD parameters every strategy cycle (typically every 1.5 s) and sets up the parameters accordingly. The temperature values are displayed in either °C or °F depending on the option selected (see Engineer Display Options), but the transfer between RD and IQL+/IQLVAV is always in °C, the conversion being done in the RD. The mechanisms mentioned below are based on the functionality in standard strategies; if a non-standard strategy is set up to use the same parameters (S9, S10, S11, S1, S2, S3, S7, and I9 for IQL+ or I12 for IQLVAV) then the RD will operate with it.


The following values are sent from the RD to the IQL+.

**S9, Local Space Temp**; the value sent to the IQL is the value from the thermistor plus the temperature offset value described in the Engineering section below.

**S10, Local SP Adjust**; adjusting the setpoint, , on the RD changes S10 which in the IQL produces a trim of between -½ to +½ multiplied by the IQL Offset range setting, K15, normal default = 2 °C, i.e. default range = -1 °C to 1 °C; USA default = 6 °F, i.e. default range = -3 °F to +3 °F.

**I9, Window PB PIR** (IQL+) or **I12, Push Button** (IQLVAV); Pressing the RD occupation button, , sets the status of I9 or I12 to one for one strategy cycle which simulates a contact closure. The IQL should be set up to use this input as a pushbutton (W5, Window Mode=0; only required for IQL11+, and W6, PIR Pb Select=0, required for IQL11+, 13+, 15+; both of these are default states). This will effectively ensure the IQL is in occupation for at least the Pb PIR Run On time (default = 1800 s, 30 mins).

*Note that the RD occupation button  will override on, it cannot override occupation off. The IQL strategy will switch occupation off at end of occupation, or when run on time expires (whichever is later).*

**S11, Local Fan Speed**; Pressing the RD fan speed button, , steps through the fan speed states from wherever it happens to be in the following sequence: 0 (off), 1 (low), 2 (medium), 3 (high), 4 (auto), and back to 0 (off). This will set the fan speed during occupation if K7, Remote Fan Spd is set to 4 (auto, default).





*Note that for the sensors S9, S10, and S11 to take their values from the RD, their type must be changed to type 6.*






IQL11+ only requires S9 and S10 to be changed. They are changed by sending a terse text communications message of the form: S9(Y=6), S10(Y=6), S11(Y=6), R(z=1) e.g. by using PowerTool. The last item, R(z=1) writes the message to Flash memory to make it permanent and causes the controller to start using the new settings; the changes will become operational about 10 seconds after the message is received

The IQL+ sends the following parameters to the RD displays:

**S1, Space Temp**; the space temperature used by the strategy, normally S9, but if there is an error in the RD's thermistor, or if the local thermistor is turned off (see Engineering section below), the IQL will use K2, RemoteSpace Temp. It will also use K2 if K2 is bound to a Lon sensor.

**S2, Actual Setpoint**; the setpoint used by the strategy, which consists of K1, Remote Setpoint, added to the offset produced from the RD trim (S10) as described above.

**S3, Occupancy**; if S3 is set to 1 (Unoccupied), the unoccupied icon, , will be shown, but if S3 is set to 0 (Occupied), 2 (Bypass), or 3 (Standby), the occupied icon, , will be shown. Pressing the RD occupation button, , during non-occupation will change the icon to occupied, , if W5, W6 are set correctly (as described in the I9 paragraph above), unless a Remote Shutdown (W8=1) is set.

**S7, Effect Fan Spd**; the Effective Fan Speed is in the range 0 (off), 1 (low), 2 (medium), 3 (high), 4 (auto). It will be 1 if there is a heating demand during non-occupation otherwise it is zero during non-occupation. During occupation it will take the value of S11 as set by the RD, if remote Fan Speed K7 is set to 4 (Auto, default, required for IQL13+, 15+). The state of S7 is displayed by 0 () , 1 () , 2 () , 3 () , 4 () **AUTO**).

**Error Displays**: These apply to the RD-IQ only.

If a read request times out, there is a communications error (e.g. the module does not exist), and the display flashes the currently displayed value and all the icons for 4 cycles every 5 s which is effectively continuous until the communications error is cleared. If a write to the controller is unacknowledged, either the RD has no PIN and the module requires one, or the PIN is of insufficient authority. The display digits flash '8.8.8' alternating with the currently displayed value and all the icons for 4 cycles every 5 s, again appearing continuous until the PIN is corrected.


## Engineering Modes

The RD has five engineering modes which can be entered by using a combination of buttons including the buttons 1 to 4 and the right engineering button (ENG) accessible by removing the front panel:

Temperature Offset (ENG + 2), RD-IQ, RD-IQL  
 Engineer Display Options (ENG + 3), RD-IQ, RD-IQL  
 Engineer Communication (ENG + 4), RD-IQ only  
 Enter PIN (ENG + 1), RD-IQ only  
 Restore Defaults (ENG + 1 + 4), RD-IQ, RD-IQL

*Note: (ENG + 1 + 4) implies buttons 1 and 4 are held down and the engineering pinhole button is pressed.*




There is also a data validation mode entered after other modes are completed as described below.

Button 4, , is illuminated during any engineering mode on RD-IQL (on RD-IQ all buttons are illuminated).

### Temperature Offset (RD-IQ, RD-IQL)

The temperature offset is added to the sensor reading before it is sent to the controller. It enables the sensor reading to be adjusted e.g. to cater for a difference in the temperatures experienced by the sensor and the occupier. It can be adjusted in the range -3 °C to +3 °C (-5.4 °F to +5.4 °F).

The mode is entered by (ENG + 2), and exited to normal mode by completing the change, pressing (ENG + 2) again, or exited by entering another engineering mode.




On entry into the mode the offset is displayed. It is always displayed in °C regardless of the units selected in the display option below. Button 1, , will lower the value, and button 2, , will raise the value. The button is changed in 0.1 °C (0.18 °F) steps. Pressing button 4, , enters the change and returns to normal operation.

### Engineer Display Options (RD-IQ, RD-IQL)

The mode is entered by (ENG + 3), and exited to normal mode by completing the sequence or pressing (ENG + 3) again, or exited by entering another engineering mode.











There are 5 display options:





- Select temperature units (°C or °F)
- Display local temperature (ON/OFF)
- Use local thermistor (ON/OFF)
- Display fan state (ON/OFF)
- Display Occupation state (ON/OFF)










**Select Temperature Units.** On entry into the mode, the 1st option is ready for editing, the entire display is blank except for the °C or °F symbol, whichever is currently selected. Button 1, , selects °C, and button 2, , selects °F. Button 4, , stores the selection to non-volatile memory and moves on to the second option. Selecting °F causes the RD-IQ to convert the measured temperature to °F before sending it to the IQ, and it expects the IQ to send values to it in °F. In contrast, the communication between RD-IQL and the IQL+ is always in °C, but currently if the RD-IQL is set to °F, the RD-IQL will convert the values received from the IQL+ to °F.








Changing temperature units also affects the setpoint increments (0.5 °C for °C and 0.5 °F for °F).

The RD-IQL has the mechanism for the IQL+ to dictate the display units and currently the IQL+ allows the RD to use its own setting but in the future the IQL+ could override the RD setting (e.g. a °F-IQL could force an RD set to °C to display in °F).

**Display local temperature.** The entire display is now blank except for the thermometer, , and knob, , symbols. In **local** and **setpoint** the symbols ,  flash together, in **setpoint** the knob symbol, , only flashes. Button 1, , selects , and button 2, , removes . Button 4, , writes the selection to non-volatile memory and moves onto the third option. With 'Display local temperature' turned off, the RD will only display the setpoint.

**Use local thermistor.** The word **On** or **Off** is displayed alongside a flashing temperature icon, . Button 1, , switches use of local thermistor **ON**, and button 2, , switches use of local thermistor **OFF**. Button 4, , writes the selection to non-volatile memory and moves onto the fourth option. For RD-IQ, with 'Use local thermistor' turned off, the RD will not send its thermistor value to the controller, and since the value displayed on the RD comes from the controller it will not be sourced from its own thermistor, but from whatever source the controller is using.

**Display fan state.** The word **On** or **Off** is displayed alongside a flashing fan icon, . Button 1, , switches display of fan state **ON**, and button 2, , switches display of fan state **OFF**. Button 4, , writes the selection to non-volatile memory and moves onto the fifth option. With 'Display fan state' turned off, none of the fan speed icons (, **AUTO** , , ) will be shown and the fan speed button, , will be disabled.

**Display occupation state.** The word **On** or **Off** is displayed alongside a flashing man icon, . Button 1, , switches display of occupation state **ON**, and button 2, , switches display of occupation state **OFF**. Button 4, , writes the selection to non-volatile memory and returns to the normal display. With 'Display occupation state' turned off, neither of the occupation state icons (, ) are displayed, and the occupation button, , will be disabled.

### Engineer Communication (RD-IQ only)

The mode is entered by (ENG + 4), and exited to data validation mode by completing the sequence or pressing (ENG + 4) again, or exited by entering another engineering mode.

This mode enables the modules that are read and written to (as described in the data transfer section above) to be changed from defaults.

On entry into the mode, the display shows the thermometer symbol, and the sensor number (Sx) in the IQ controller used for local space temperature both flashing. Button 1 decrements the number, button 2 increments it. Button 4 writes the selection to non-volatile memory and moves on to the next selection. The sensor can be selected from the range S1 to S9.

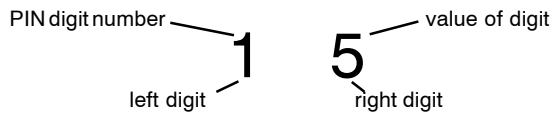
The process is repeated for the setpoint (Ka, the knob symbol flashes), the fan speed knob (Kc, the fan symbol flashes), and the occupation status (Kb, the occupancy symbol flashes). The knobs can be selected from the range K1 to K9

After selecting Kc and pressing button 4 the RD enters data validation mode.

**Engineering Modes** (continued)**Enter PIN** (RD-IQ only)

The mode is entered by (ENG + 1), and exited to normal mode by completing the sequence or discarding the changes by pressing (ENG + 1) again, or exited by entering another engineering mode.

On entry into this mode, regardless of any PIN currently set on the RD, the right digit is set to '5'. The left digit is set to a flashing '1' to indicate this is the first digit (most significant) of the PIN. Button 1 decrements the number in the right digit, button 2 increments it. Button 4 writes the selection to non-volatile memory and moves on to the next PIN digit indicated by the first display digit now being set to a flashing '2'.



The process is repeated for all four PIN digits (1 to 4, working from most significant to least significant, left to right).

After selecting the fourth PIN digit and pressing button 4, the RD checks that there was at least one press of button 1 or button 2 before button 4 was pressed for each digit; if there was, the new PIN is written to memory, if not, the new PIN is discarded and the old value retained. The RD then returns to normal operation.

**Restore Defaults** (RD-IQ, RD-IQL)

The mode is entered by (ENG + 1 + 4), and exited to validation mode automatically.

This mode returns the 'out of the box' defaults.

The following apply to -IQ and -IQL:

Temperature units	°C
Display local temperature	ON
Use local thermistor	ON
Display fan state	ON
Display Occupation state	ON

The following apply to -IQ only:

Local temperature	S9
Setpoint	K1
Occupation Status	K6
Fan speed status	K7
PIN	none

After a restore, the RD-IQ only enters data validation mode

**Data Validation Mode** (RD-IQ only)

After completing either Engineer Communication, or Restore Defaults, the RD enters data validation mode to ensure that the selections made can be correctly used.

The RD requests values in sequence from the modules selected (Sx, Ka, Kb, Kc). (Kc will not be polled if c=0), followed by a write to each value. The display will indicate errors in the normal way (see Error Displays section).

**COMPATIBILITY**

**RD-IQ:** The RD-IQ is compatible with all IQ controllers with text comms capability (all IQ3s, IQ2xx and IQ1xx firmware v4.7 or greater). However, if retro-fitting to a controller, the local supervisor port should not already be in use (i.e. by SDU-IQ or SDU-xcite IQView/RS232, Wireless Sensor Receiver XW/R/IQ, NDP, or local PC), and the 'sUperv port addr' should be set to zero (default). *Note that the RD-IQ is not compatible with /ADL, /ATM or XNC220 controllers as the RS232 port is already in use.*

The standard IQ2xx connection is by an RJ11 to RJ11 cable (RD/SDU-IQ2COMMSCABLE/3M 3m, 9' 10", RD/SDU-IQ2COMMSCABLE/10M 10m, 32'10"). This will give RS232 + power for the following controllers: all IQ3s, IQ204, later IQ21x (board AM103614 v2 or greater), later IQ22x, IQ23x, IQ241/242, IQ246. An adapter extension cable RJ11 socket to RJ11 plug plus a 2 terminal power connection (for connection to the IQ's 24 V auxiliary supply), RD/SDU-IQ2xx, can be used for early IQ21x, early IQ22x, IQ250, IQ251, and later IQ1xx.

IQ1xx controllers with a 5 in line RS232 port can use the adapter extension RD/SDU-IQ1xx+, RJ11 socket to 5 in line socket plus a 2 terminal power connection (for connection to the IQ's 24 V auxiliary supply). IQ1xx controllers with a 25 way D type RS232 port can use the adapter extension RD/SDU-IQ1xx, RJ11 socket to 25 way D type plus a 2 terminal power connection (for connection to the IQ's 24 V auxiliary supply). Alternatively, power may be connected separately through a 2 terminal connector.

The RD-IQ uses the following parameters as defaults:

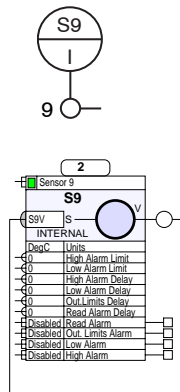
Local temperature	<b>S9</b>
Setpoint	<b>K1</b>
Occupation Status	<b>K6</b>
Fan speed status	<b>K7</b>
PIN	<b>none</b>

The IQ strategy must comply with these settings or the RD-IQ must be changed using the Engineering Communication feature described above.

The strategy must not overwrite the local temperature value.

For example in IQ1xx, IQ2xx, if the default S9 is used, then Sensor Module 9 must be an internal sensor sourced from node 9. The sensor should be sequenced (e.g. for logging).

In IQ3 all the modules used must be created in SET, the sensor must have its output looped back to its input, and the sensor **must** be sequenced



**RD-IQL:** The RD-IQL is compatible with IQL11+, IQL13+, IQL15+ and IQLVAV. The IQL+ controller must have a digital input (hence IQL11+, 13+, or 15+), and it must have the TBus operative indicated by the plus (+) in the product code.

The IQL11+, IQLVAV can use RD-IQL/K, /KOS, whereas IQL13+, IQL15+ can use RD-IQL/K, /KOS, /KOSF.

The RD's potentiometer must be used (if a potentiometer is required); a direct connected potentiometer may not be used. A direct connected temperature sensor may be used rather than the RD's.

RD-IQL/K precludes the use of PIR/pushbutton input. On IQLVAV it also precludes the use of the alarm contact input. A separate fan speed switch may be used (for IQL13+, 15+).

RD-IQL/KOS as RD/IQL/K except push button is provided. RD-IQL/KOSF as RD/IQL/KOS except Fan Speed Switch provided (for IQL13+, 15+). A separate Fan speed switch may be used rather than the RD's.

The IQL+ must have a standard strategy installed, or the installed strategy must have the following standard item allocations:

- S9, Local Space Temp** - IQL11+, 13+, 15+, IQLVAV
- S10, Local SP Adjust** - IQL11+, 13+, 15+, IQLVAV
- I9, Window PB PIR** - IQL11+, **PB PIR** - IQL13+, 15+
- I12, Push Button** - IQLVAV
- S11, Local Fan Speed** - IQL13+, 15+
- S1, Space Temp** - IQL11+, 13+, 15+, IQLVAV
- S2, Actual Setpoint** - IQL11+, 13+, 15+, **Setpoint** - IQLVAV
- S3, Occupancy** - IQL11+, 13+, 15+, IQLVAV
- S7, Effect Fan Spd** - IQL13+, 15+

The IQL+/IQLVAV **must** be set up as follows:

- Local Space Temp Type S9(Y=6)** (use RD) - IQL11+, 13+, 15+, IQLVAV
  - Local SP Adjust Type S10(Y=6)** (use RD) - IQL11+, 13+, 15+, IQLVAV
  - Local Fan Speed Type S11(Y=6)** (use RD) - IQL13+, 15+
- These setting are facilitated by IQLTOOL2

If it is required to use a separate temperature sensor, leave Local Space Temp Type at default, S9(Y=1). If it is required to use a separate Fan Speed Switch, leave Local Fan Speed Type at default, S11(Y=3).

The following only need setting up if they have been changed from default:

- Window Mode W5(S=0)** (not window mode, default) - IQL11+ only
- PIR Pb Select W6(S=0)** (Pb selected, default) - IQL11+, 13+, 15+
- Remote Fan Spd K7(V=4)** (auto, default) - IQL13+, 15+

**R(z=1)** The controller **must** be reset after changing parameters to store the changes to flash, and to start using the new settings. *Note that if the strategy is non standard, parameters equivalent to W5, W6, and K7 should be set appropriately.*

## INSTALLATION

The RD should be mounted on a standard electrical back box or front panel using two screws. *Note that the display is not backlit and relies on ambient light.* The installation involves:

Mount unit

Connect power (if necessary)

Connect to controller

Configure controller

Configure RD

Test

The installation procedure including configuration is covered in the RD-IQ installation instructions TG200492, and the RD-IQL installation instructions TG200576. Installation of the WSA wall sensor adaptor plate is covered by TG200842.

CONNECTIONS

RD-IQ

**Supply**

Separate supply connection only required for: early IQ21x, early IQ22x, IQ251, IQ250, IQ1xx controllers if not using adapter cables

24 Vdc 10 mA

24 Vac 10 mA

\*If one side of the 24 Vac supply is connected to 0 V, that side must be connected to the RD - (negative) terminal

RD-IQ  
(rear view)

IQ Controller see opposite

**IQ Controller**

**IQ3, IQ2xx**

RD/SDU-IQ2COMMSCABLE/3M (3m)  
RD/SDU-IQ2COMMSCABLE/10M (10m)

If required a cable can be made to the required length, wired as below

25 m (28 yds) maximum	
RJ11 1 2 3 4 5 6	RJ11 6 5 4 3 2 1

Local supervisor port RJ11 carries signal and power from: All IQ3s, IQ204, later IQ21x, later IQ22x, IQ23x, IQ241/242, IQ246

For later IQ1xx, early IQ21x, early IQ22x, and IQ250/251 the adaptor RD/SDU-ADAPTOR IQ2xx can be used

RD/SDU-IQ2COMMSCABLE/3M (3m)  
RD/SDU-IQ2COMMSCABLE/10M (10m)

RD/SDU-ADAPTOR IQ2xx

For early IQ1xx with a 5 in line RS232 connector the adaptor RD/SDU-ADAPTOR IQ1xx+ can be used

RD/SDU-IQ2COMMSCABLE/3M (3m)  
RD/SDU-IQ2COMMSCABLE/10M (10m)

RD/SDU-ADAPTOR IQ1xx+

For early IQ1xx with a 25 way RS232 connector the adaptor RD/SDU-ADAPTOR IQ1xx can be used

RD/SDU-IQ2COMMSCABLE/3M (3m)  
RD/SDU-IQ2COMMSCABLE/10M (10m)

RD/SDU-ADAPTOR IQ1xx

RD-IQL

**IQL+/IQLVAV Controller**

Digital TBUS input carries signal and power from all compatible IQL+s and IQLVAV. It connects to the first digital input, IN3 for IQL11+, IN4 for IQL13+, IQL15+, IN5 for IQLVAV.

RD-IQL  
(rear view)

## DISPOSAL

COSHH (Control of Substances Hazardous to Health - UK Government Regulation 2002) ASSESSMENT FOR DISPOSAL OF RD. No parts affected.

### RECYCLING.

All plastic and metal parts are recyclable. The printed circuit board may be sent to any PCB recovery contractor to recover some of the components for any metals such as gold and silver.

### WEEE Directive :



At the end of their useful life the packaging and product should be disposed of by a suitable recycling centre.  
Do not dispose of with normal household waste.  
Do not burn.

## ORDER CODES













	US order code	
<b>RD-IQ/K</b>	<b>*882001500</b>	Room Display for use with IQ controller with local thermistor temperature sensor and setpoint control
<b>RD-IQ/KOS</b>	<b>*882001510</b>	Room Display for use with IQ controller with local thermistor temperature sensor, setpoint control, occupation override, and occupation status display
<b>RD-IQ/KOSF</b>	<b>*882001520</b>	Room Display for use with IQ controller with local thermistor temperature sensor, setpoint control, occupation override, occupation status display, and fan speed control
<b>RD-IQL/K</b>	<b>*882001530</b>	Room Display for use with IQL+ controller with local thermistor temperature sensor and setpoint control (IQL11+, 13+, 15+, IQLVAV). Window contact inoperative on IQL11+, alarm contact inoperative on IQLVAV, PIR/pushbutton inoperative on IQL11+, 13+, 15+, IQLVAV, fan speed switch inoperative on IQL13+, 15+
<b>RD-IQL/KOS</b>	<b>*882001540</b>	Room Display for use with IQL+ controller with local thermistor temperature sensor, setpoint control, occupation override, and occupation status display (IQL11+, 13+, 15+, IQLVAV). Window contact inoperative on IQL11+, alarm contact inoperative on IQLVAV, PIR inoperative on IQL11+, 13+, 15+, fan speed switch inoperative on IQL13+, 15+
<b>RD-IQL/KOSF</b>	<b>*882001550</b>	Room Display for use with IQL+ controller with local thermistor temperature sensor, setpoint control, occupation override, occupation status display, and fan speed control (IQL13+, 15+). PIR inoperative.

\* all US order codes include wall sensor adaptor plate and appropriate screws.

<b>RD/SDU-IQ2COMMSCABLE/3M</b>	<b>882000450</b>	RJ11 plug to RJ11 plug cable (3m) for RD-IQ connection to most IQ controllers (connects RS232 and power for all IQ3s and most IQ2xx controllers - see text)
<b>RD/SDU-IQ2COMMSCABLE/10M</b>	<b>882000460</b>	RJ11 plug to RJ11 plug cable (10m) for RD-IQ connection to most IQ controllers (connects RS232 and power for all IQ3s and most IQ2xx controllers - see text)
<b>RD/SDU-ADAPTORIQ1xx+</b>		RJ11 socket to 5 in line socket (RS232) + 2 wide power terminals adaptor cable for RD-IQ connection to early IQ1xx series controllers, use in conjunction with RD/SDU-IQ2COMMSCABLE/3M,/10M
<b>RD/SDU-ADAPTORIQ1xx</b>		RJ11 socket to 25 Way D type male (RS232) + 2 wide power terminals adaptor cable for RD-IQ connection to early IQ1xx series controllers, use in conjunction with RD/SDU-IQ2COMMSCABLE/3M, <b>ADAPTOR/10M</b>
<b>RD/SDU-ADAPTORIQ2xx</b>		RJ11 socket to RJ11 plug + 2 wide power terminals adaptor cable for RD-IQ connection to later IQ1xx and early IQ2xx controllers, use in conjunction with RD/SDU-IQ2COMMSCABLE/3M,/10M
<b>IQLTool2</b>		Toolset applet allows the IQL+/IQLVAV to be configured to run with RD-IQL (runs within Toolset container, e.g. SET v5.1 or greater). It is available from Trend website or on SET CD and requires a valid licence to run
<b>ACC/SMBOX/16/10</b>	<b>882000440</b>	16 mm depth surface mount box for RD (pack of 10 boxes)
<b>WSA/10/USA</b>	<b>882001560</b>	Pack of 10 wall sensor adaptor plates to facilitate mounting RD on US or Danish wall boxes. Each plate complete with 2 plastic covers, 2 back box screws, and 2 off 3.5 mm RD screws.

## SPECIFICATIONS

### Electrical

Supply	:(RD-IQ only) 24 Vdc (20 to 33 Vdc), 24 Vac $\pm 10\%$ 50/60 Hz
Consumption	:(RD-IQ only) 10 mA
Buttons	:4 buttons on front panel printed with icons (Decrement  , Increment  , Fan  , Occupation  ); if the front panel button is not used in the variant it is left blank. Plus 2 engineering buttons under front panel (unused, Engineering).
Display	:LCD 3 digit + 11 custom icons non backlit
Digits	:Setpoint or local space temperature (other displays in engineering mode, e.g. PIN)
Knob	:  , Setpoint displayed
Thermometer	:  , Local temperature displayed
Units	: <b>C</b> or <b>F</b>
Occupation	:Occupied  , or Unoccupied 
Fan	:  , fan being controlled
Fan speed	:Auto ( <b>AUTO</b> ), low  , medium  , or high 
Communication	: :RS232 9k6 baud, 7 bit, odd parity, Values monitored/updated by terse text comms. Maximum distance 25 m (28 yds)
RD-IQ	:TBus. Maximum distance 30 m (33 yds)
RD-IQL	:PIC16F876
CPU	:8 kbyte
Flash	:256 byte
EEPROM	:10 k $\Omega$ @ 25 °C (77 °F)
Thermistor	:10 °C (50 °F) to +40 °C (104 °F, $\pm 1.8$ °F) (recommended)
Temperature range	:System accuracy $\pm 1$ °C (0 to 40 °C, 32 °F to 104 °F)
Temperature Accuracy	:Increment, decrement by 0.5 °C, if display set to °C, and by 0.5 °F, if display set to °F
Setpoint Control	:Increment, decrement by 0.1 °C, (0.18 °F), range -3 °C to + 3 °C (-5.4 °F to +5.4 °F)
Temperature Offset	

### Mechanical

Dimensions	:90 mm (3.54") x 90 mm (3.54") x 25 mm (0.98") from electrical back box 90 mm (3.54") x 90 mm (3.54") x 30 mm (1.18") maximum
Material	
Front panel	:ABS
Front	:Polycarbonate
Back	:ABS
Buttons	:Shore 80 PVC
Weight	:130 gms, (0.29 lbs)
Protection	:IP30, NEMA1

### Connections

RD-IQ	:IQ Controller. Maximum distance 25 m (28 yds). RJ11 also connects power for all IQ3s and most IQ2xx controllers (see text); use RJ11 to RJ11 cable RD/SDU-IQ2COMMSCABLE/3M, or RD/SDU-IQ2COMMSCABLE/10M. For IQ1xx use additional adaptor cable RJ11 to 5 -in line + 2 wide power RD/SDU-ADAPTOR IQ1xx+, or RJ11 to 25 Way D type Male + 2 wide power RD/SDU-ADAPTORIQ1xx. For late IQ1xx and early IQ2xx use additional adaptor cable RJ11 to RJ11 + 2 wide power RD/SDU-ADAPTORIQ2xx.
RD-IQ	:Power. 2 part connector with 2 screw terminals for 0.5 to 2.5 mm <sup>2</sup> (14 to 20 AWG) cross section area cable
RD-IQL	:TBus connects power and signal. Maximum distance 30m (33 yds). Polarity independent, 2 part connector with 2 screw terminals for 0.5 to 2.5 mm <sup>2</sup> (14 to 20 AWG) cross section area cable

### Environmental

EMC	
emissions	:EN50081-1
immunity	:EN50082-2
electrical safety	:EN61010
Ambient limits	
storage	:-10 °C (14 °F) to 50 °C (122 °F)
operating	:-10 °C (14 °F) to 45 °C (113 °F)
humidity	:0 to 90 %RH
Version	
firmware	:RD/IQ v1.04, RD/IQL v1.02
board	:AM104746 issue 2

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