TREND

**Display Panel
Manual**

CONTENTS

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1   INTRODUCTION

1.1   The Display Panel

The Display Panel (sometimes referred to as the 2-line Display to distinguish it from the Network Display Panel) enables the user to view and adjust selected parameters of an IQ controller. This is achieved by four direction buttons and a 2 row, x 40 character, LED backlit, liquid crystal display. In addition four pre-programmable buttons make commonly changed values available by single button selection. It provides all the facilities necessary for the operation of a stand alone building control system.

The Display Panel may be:

>   an integral part of a Controller
>   an externally mounted option to a Controller
>   or a portable unit that may be connected to a Controller, wherever and
>   whenever required.

The Display Panel has no intelligence of its own. The program for its operation is resident in the currently connected controller. Power and communications are connected over the multi-way cable between the display panel and controller. It may not be used to communicate with controllers other than the one to which it is directly connected.

1.2   About This Manual

This manual provides information on the installation and use of the Display Panel. It does not contain the detailed information on configuring or installing the controller. Labels and other values used by the Display Panel must be set up using a Trend supervisor or engineers tool. Configuration instructions are contained in the IQ Configuration Reference Manual, 90-1533.

Information contained in this manual is related to IQ2xx Firmware versions 1,2 (IQ1xx Firmware versions 5, 6, 7, and 8).
Information is provided in 3 sections:

>   Section 1   Introduction, Display Panel Types, and Compatibility
>   Section 2   Installation
>   Section 3   Operation

INTRODUCTION

1.3　　　　Types of Display Panel

1.3.1　　　Membrane Types

There are two versions of display panel membranes. The first (M1) is used on all current display panel products including integal fitting into IQ2xx series controllers. The older membrane (M2) was used on old display panel products but is the only panel that can be integrally fitted into old IQ1xx series controllers.

Membrane version M1　　　　　　　　　Membrane version M2
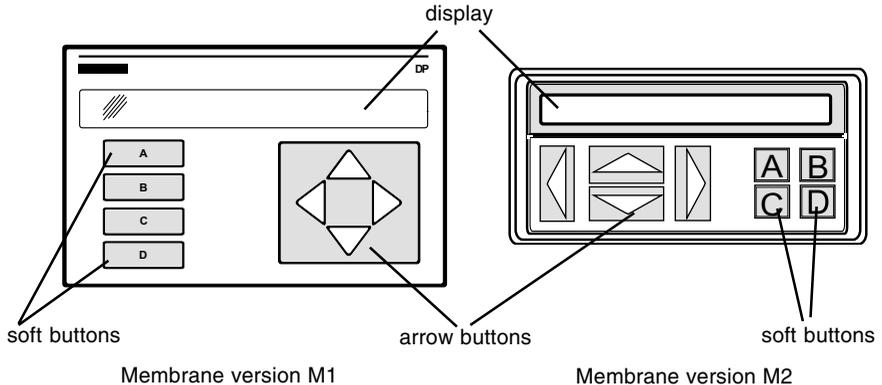
- •　　　LED backlit, Liquid Crystal Display, 2 rows x 40 characters
- •　　　4 arrow buttons
- •　　　4 user-programmable soft buttons A,B,C & D
- •　　　all keys have tactile feedback

1.3.2　　　Display Panel Types

Display Panel Types

There are two basic types with the new membrane (M1), DP2 and DP (sometimes referred to as 2DP). They both use LED backlit, LCD (liquid crystal) displays.

　　　DP2 : This display panel may be mounted in the cover of an IQ2xx controller. It cannot be used outside a controller. It is identified by a 34 way (IDC type) connector (normally via an attached ribbon cable).

　　　DP : This display panel may be mounted outside a IQ2xx controller (if the controller has an 'RDS', Remote Display Support, interface board fitted). It may also be used external to IQ1xx controllers. It is identified by a 25 way male 'D' type connector.

1.3.2   Display Panel Types (continued)

There was also an earlier display panel type with the old membrane (M2) which
was used either externally or fitted in the cover of an IQ1xx controller. The
external version had a 25 Way male 'D' type connector and the integral version
had a 26 Way (IDC type) connector. Integral versions were supplied with a 26
Way to 26 Way (IDC) adaptor ribbon cable or a 26 Way IDC to 25 Way 'D' type
male adaptor cable (for IQ9xe, IQ8xe).

All of these display panel types may be fitted in the cover of an IQ controller,
fitted in the front of a panel, or provided as a hand held unit which can be plugged
into the controller.

1.3.3   Integral Display Panel

An IQ22x, IQ241, or IQ242 controller may be purchased with an integral
display panel (DP2) fitted in the cover. The display panel thus requires no
installation, and will operate directly the controller is powered. These controllers
may also be retrofitted with a display panel by purchasing the the appropriate
retrofit kit which includes a cable, and installation instructions and for the
IQ22x, a replacement cover (fitted with a display panel), and for the IQ241 or
IQ242, a display panel with nylon pillars for fitting into the cover.

*Note that a display panel may reduce the controller's available 24 Vdc supply
current by 30 mA.*

1.3.4   Display Panel in Front of Panel

A display panel (DP) may be remotely
mounted away from the controller, for
example on a panel door. This is done by using
the front panel mounting kit (FPK).
Alternatively the standard 600 x 600 mm
enclosure may be purchased with the display
panel already fitted in the door (ENCLS/FP).
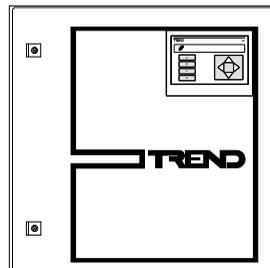
Standard enclosure with display
panel fitted (ENCLS/FP)

A 3 m cable is supplied with both of these options. If fitting a display panel to
a controller, note that it may reduce available 24 Vdc supply current by 30 mA.
The kit (FPK) provides 4 screws for mounting on a panel door up to 5 mm thick;
for a thicker door the installer should provide longer 4 mm screws.

INTRODUCTION

1.3.4   Display Panel in Front of Panel (continued)

Detail of display panel fixed to door using fixing kit (FPK)
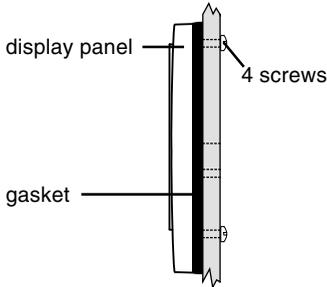
The backplate may be used as a template to cut the holes in the panel.
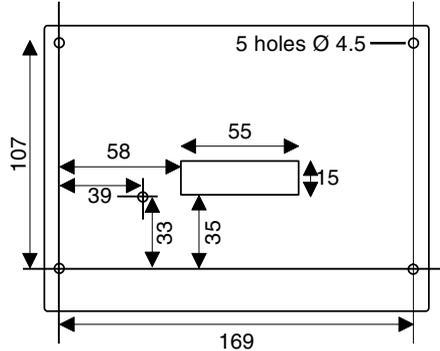
Note that the display panel is not suitable for mounting outside a building.

It can be used on an IQ22x, IQ241, IQ242, or IQ250 controller if it has been fitted with an 'RDS' interface. It can also be used with an IQ204 or any IQ1xx series controller except an IQ7x, IQ9x, IQ9x+, (although it may be used with an IQ9xe).

1.3.5   Hand Held Display Panel

The display panel (DP) is also provided as a hand held unit (HDP). This allows the user to plug the display panel into a controller either permanently or on a temporary basis. It is useful as a portable tool for locally monitoring and adjusting a number of controllers. A 1 m cable is supplied with the HDP. When plugging a display panel into a controller note that it may reduce available 24 Vdc supply current by 30 mA.
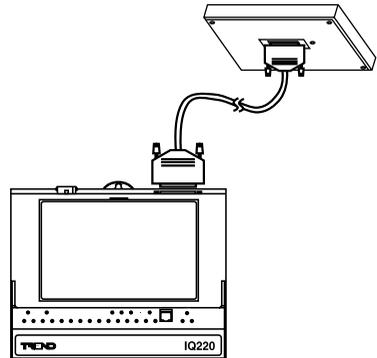
It can be used on an IQ22x, IQ241, IQ242, or IQ250 controller if it has been fitted with an 'RDS' interface. It can also be used with an IQ204 or any IQ1xx series controller except an IQ70, IQ90, IQ90+, (although it can be used with an IQ9xe).

1.4 Compatibility

Series	Controllers	Integral Display Panel		Remote Display Panel (FP, FPK, HDP)	
		M1/DP2	M2	M1/DP	M2
IQ2xx	IQ21x	✘	✘	✘	✘
	IQ22x	✓	✘	✓*	✓*
	IQ241, 242	✓	✘	✓*	✓*
	IQ246	✘	✘	✘	✘
	IQ250	✘	✘	✓*	✓*
	IQ251	✘	✘	✘	✘
	IQ204	✘	✘	✓	✓
IQ1xx	IQ7x	✘	✘	✘	✘
	IQ9x, 9x+, 10x	✘	✘	✘	✘
	IQ9xe, 8xe	✘	✓**	✓	✓
	IQ100+	✘	✓	✓	✓
	IQ111, 111+, 131,131+, 151, 151+	✘	✓	✓	✓
	IQ104/OEM	✘	✘	✓	✓

Key
M1   :new membrane
M1/DP2   :new membrane with DP2 type display
M1/DP   :new membrane with DP type display
M2   :display panel with old membrane
*   :These controllers need to have /RDS option fitted
**   :These controllers need special 24 W to 24 W IDC cable

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1.5   Product Codes

IQ2xx/DP/   :IQ2xx (IQ22x, IQ241, IQ242) controller with display panel fitted in cover.

KIT/DP2   :Kit for retro-fitting display panel into IQ241 or IQ242, complete with display panel, nylon pillars, attached ribbon cable, and installation instructions.

COVER/DP/IQ22x :Kit for replacing cover of IQ22x with cover pre-fitted with display panel complete with attached ribbon cable and installation instructions.

FPK   :Kit for fitting display panel to the front of a panel complete with display panel, gasket, fixing screws, 3 m cable, and installation instructions.

ENCLS/FP   :600 x 600 x 210 mm cabinet pre-fitted with display panel complete with 3 m cable, fixing screws, and ENCLS installation instructions. The ENCLS cabinet is pre-drilled to fit a range of IQ controllers.

HDP   :Hand held display panel complete with 1 m cable.

Note that all the above display panel products are supplied with a display panel manual.

KIT/2XX/RDS   :Kit for fitting the remote display support (RDS) interface into an IQ2xx controller (IQ22x, IQ241, IQ242, or IQ250) to enable a remote display panel (front of panel, or hand held) to be connected to the controller, complete with attached ribbon cable, fixing screws, and installation instructions.

CABLE/58-0935   :1 m length, 25 way 'D' type male to 25 way 'D' type female cable for connecting display panel to controller.

CABLE/58-0836   :3 m length, 25 way 'D' type male to 25 way 'D' type female cable for connecting display panel to controller.

2   INSTALLATION

The display panel comes in 3 versions:
Hand held (HDP)
Integral mounted (/DP or retrofit, COVER/DP/IQ22x, KIT/DP2)
Front panel mounting (FPK or ENCLS/FP)

2.1   Hand Held Display Panel

The hand held version (HDP) is plugged into the controller via the adaptor cable provided (CABLE/58-0935, 1 m). Its installation is described below (section 2.5).

In order to connect the HDP to IQ2xx Series Controllers (IQ22x, IQ241/242, IQ250) the controller must have the /RDS option fitted by using KIT/2xx/RDS (see section 2.4). (The IQ204 does not need the /RDS option to connect to the HDP).

hand held unit (HDP)

Connector to IQ Controller
(signal and power)

168 mm

144 mm

105 mm

190 mm

32 mm

rear

viewing angle adjustment
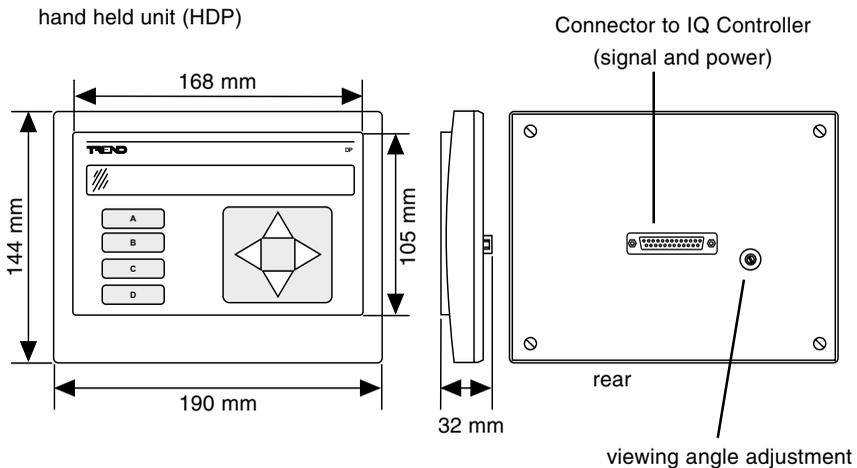
INSTALLATION

2.2   Integral Mounting Display Panel

The controllers (IQ22x, IQ241/242) may be ordered with the display panel fitted in the cover (/DP/ option).

The display panel may be fitted into the IQ241/242 at a later date by using the KIT/DP2 product. This process is described in:

KIT/DP2 Retrofit Display Panel Kit Installation Instructions (IQ241/242), TG103173.

The IQ22x cover may be exchanged for a cover incorporating the display panel by using the COVER/DP/IQ22x product. The installation process is described in: COVER/DP/IQ22x IQ22x Replacement Cover with Display Panel Installation Instructions, TG200140.

2.3   Front Panel Mounting Display Panel

This can either be a kit for fitting the display panel in a panel door (FPK), or a cabinet pre-fitted with the display panel (ENCLS/FP).

The installation of the FPK is described in: FPK Front Panel Kit (2-Line Display Panel) Installation Instructions, TG200179.

The ENCLS/FP comes pre-installed, so there are no separate display panel installation instructions.

Both of the above panels come with adaptor cable 3 m CABLE/58-0836 which need to be connected to the IQ Controller and tested as described below (section 2.5). In order to connect the FP, FPK to IQ2xx Series Controllers (IQ22x, IQ241/242, IQ250) the controller must have the /RDS option fitting by using KIT/2xx/RDS (see section 2.4) (The IQ204 does not need the /RDS option to connect to FP or FPK).

2.4   Remote Display Support
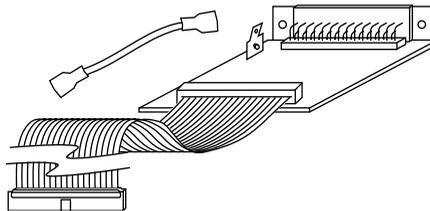
This interface board can be fitted to an IQ22x, IQ241/242, IQ250 to enable a remote display panel to be connected to the controller.

Its installation process is described in KIT/2xx/RDS Remote Display Support Kit Installation Instructions TG103128.

2.5   Installation of Remote Display Panels.

2.5.1   Location

Ambient Limits
The display panel specification is 0 to 50 °C and 0 to 90 % RH (non-condensing), however IQ Controllers are normally rated at 0 to 45 °C, and the display panel will generally be in the same environment as the IQ Controller.

IP Ratings
        HDP   :IP30
        ENCLS/FP   :IP54 (if panel properly closed)
        FPK   :membrane rated at IP54. When mounted in a panel, total
                        rating depends on rating of panel.

Note that the display panel is not suitable for mounting outside a building.

INSTALLATION

2.5.2   Connect to Controller

HDP (rear of unit)
(DP board used in FP, FPK, shown dashed)

25 W D Female

screened cable
CABLE/58-0935 (1 m)
or CABLE/58-0836 (3 m)

25 W D Male

DP Connector
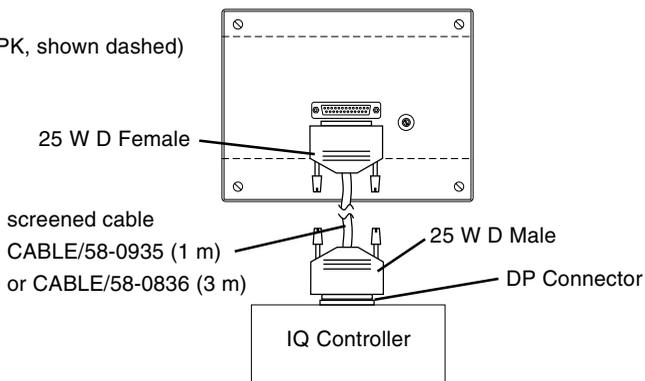
IQ Controller

The details of connecting to the controllers are given in their installation instructions:

IQ22x Installation Instructions - Options, TG200009
IQ24x Installation Instructions - Options, TG200146
IQ25x Installation Instructions, TG103483
IQ204 Installation Instructions - Options, TG200154

Note that use of cables or connections other than those specified by Trend may result in failure to comply with EMC requirements.

The cables must be screened.

Note that plugging a display panel into a controller may reduce available 24 Vdc supply current by 30 mA.

2.5.3   Test Operation
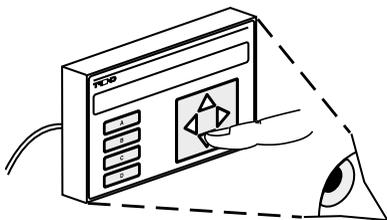
Note that if the display panel is connected to a controller that is already powered, then the display should be reset by pressing one of the programmable soft-buttons labelled A-D.

Test display panel operation by making selections as described in Section 3.

2.5.4   Adjust Viewing Angle
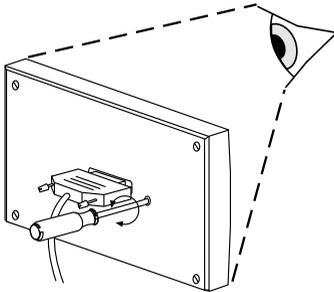
The viewing angle should be adjusted if the display panel appears to be faint. The adjustment is made by turning a small slot head screw located behind and to the right of the display panel connector when viewed for the rear.

2.5.5   Configure Controller

or
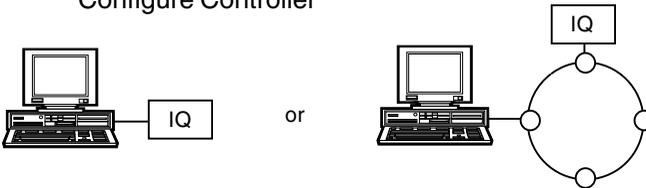
Controller configuration is explained in IQ Configuration Manual 90-1533 and 822+/Toolbox Manual 90-1129.

The following parameters may be set up using the controller configuration mode to customise the display panel (see Section 3).

Passwords
Password levels on Knobs and Switches
Range of Knobs
Labels and Units of Sensors, Knobs, Switches, Drivers, Zones
Language

Note that if some of an item type's labels are set up, on those items of that type with preset labels will be seen on the display panel but if no labels of an item type are set up, all items of that type can be seen.

INSTALLATION

2.5.6   Set up Programmable Buttons
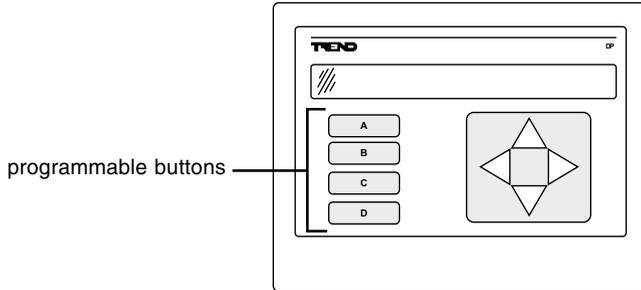
The setting of the programmable buttons is explained in sections 3-5.

3   USING THE DISPLAY PANEL

This section of the manual provides general operating instructions, the principles of operation, and an example of each Display Panel page.

3.1   General

The Display Panel is used for:

Monitoring:	Controller temperatures, setpoints, hours-run, and plant status
Adjustments:	Controller setpoints, controller overrides, time and calendar functions, and reset hours-run and counters.

Adjustments may be password protected, in which case a valid Personal Identification Number (PIN) must be entered before the operation can go ahead. (See Section 3.6).

Before the Display Panel can be used the following controller items must be set up (if required for future monitoring or adjustment by the Display Panel) using configuration mode:

Passwords
Password Levels on Knobs and Switches
Range of Knobs
Labels and Units for Sensors, Knobs, Switches, Drivers and Zones.

The language of the Display Panel may be changed by altering the display panel language selection in the controller configuration mode address module; it cannot be changed from the Display Panel itself. The languages that may be selected are: English, Spanish, Finnish, Swedish, Norwegian, Danish, German, Italian, Portuguese, and French. Changing the Display Panel language also changes the language of transmitted text alarms.

Note: For any Display Panel page, labelling of items will have the following effect:
- where no item has a label - all items will be displayed.
- where one or more items have labels - only the items with labels will be displayed.

USING THE DISPLAY PANEL

3.2   Principles of Operation

There are two versions of the Display Panel Membrane: Version 1 and Version 2, both are shown below.

Membrane version M1

Membrane version M2
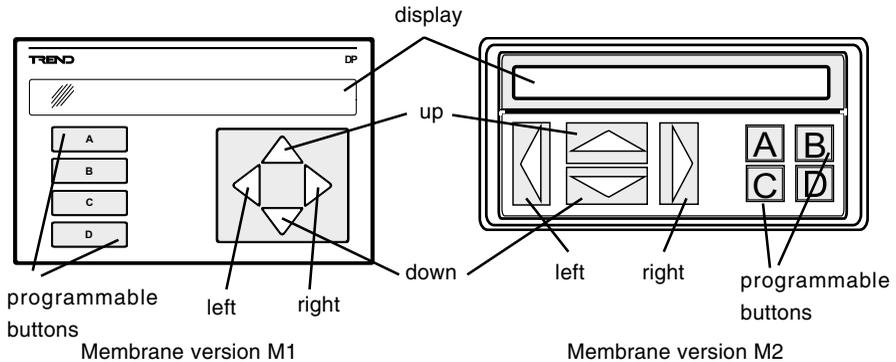
The Display Panel is divided into the **display** and the **keypad**:

The **display** consists of two rows of text and data. Each row is 40 characters long and displays text labels and variable data in different fields.

The **keypad** comprises two parts:

The group of four **arrow buttons** designated **left**, **right**, **up** and **down** allow access to monitor information and make changes. The **left** and **right** buttons are used to position the cursor on the displayed values which may be adjusted. The **up** and **down** buttons are used to increase and decrease the value at the cursor position. If a button is held down, this will cause the button action to be repeated at half second intervals.

The four **programmable buttons** labelled **A**, **B**, **C**, and **D** can be programmed to view any four specified display pages. This allows direct access to particular locations without having to manually step through the normal display sequence. For example they could be set up as follows:

A = Occupation Setpoint   Knob 1
B = Non-occupation Setpoint   Knob 2
C = Occupation Override   Switch 1
D = Alarm 20   the last recorded alarm

3.3   The Display Page

3.3.1   Display Format

Of the twelve display pages, nine are formatted in a similar manner, and present the following data:

> Item type
> Item number
> Item label
> Data specific to that item

Each display page will be covered in detail below, and will be described using an example and a list of the display field options. All fields on a display page will be refreshed every 5 seconds.

3.3.2   Data Presentation

Numbers are of three different types; integers, real numbers, and times.

Integers (item numbers, communications addresses etc) are displayed as three characters with leading zeros not displayed. e.g. 1, 22, 230.

Real numbers (sensor values, knob values etc.) are displayed in as six characters with leading leading zeros not displayed. e.g. 433, 6355.28. The decimal point position is determined by the exponent value of a sensor and there is always one decimal place allowed for knobs in a range from -999.9 to 9999.9.

Times are shown as four digits separated by a colon in HH:MM format (i.e. 24 hour notation, hour hour : minute minute e.g. 08:24, 12:30).

3.3.3   Display Page Selection

When first powered up, the display cursor appears at the top left-hand corner of the STATUS PAGE. (If the display panel is connected to a controller which is already powered e.g. using a Hand Held DP, then the display should be reset by pressing one of the programmable buttons labelled A to D). From this position the cursor can be moved between the data areas which may be changed using the **left** and **right** arrow buttons. Pressing the **left** or **right** button several times moves the cursor back to its original position at the top left-hand corner of the display i.e. the cursor 'wraps around'.

USING THE DISPLAY PANEL

3.3   The Display Page (continued)

Only when the cursor is in the top left-hand position of the page display can the next display page be called. This is done by pressing the **up/down** buttons. Starting from the STATUS PAGE and pressing the **up** button, the sequence of pages that appears in the display is shown below.

Starting from the STATUS PAGE and pressing the down button, the sequence of pages is reversed (i.e. Status Page - (Dialler page) - Alarm Page etc.).

3.3.4   IQ2xx Series Controllers (and IQ151+) - Display Page sequence

STATUS PAGE	Controller address, issue no.
TIME PAGE	Controller time/date, seasonal change dates
SENSOR PAGE	Sensor and controller calculated values
DIGITAL INPUT PAGE	Status signals
KNOB PAGE	User adjusted values - e.g. Setpoints
SWITCH PAGE	User - manual switch actions
DRIVER PAGE	Controller output signal status
TIME ZONE PAGE	On/Off time periods 5 zones
OPTIMUM START/STOP	System calculated heating/cooling times
CALENDAR PAGE	Holiday settings
ALARM PAGE	Shows up to 20 recorded alarms
DIALLER PAGE	Autodialling Status (IQ22x/ADL only)

3.3.5   IQ1xx Series Controllers (except IQ151+) - Display Page sequence

Inputs and Internals display the output of the Sensor module on the Display Panel. Therefore, if a Universal Input is used as a digital input, the input/internal will only display its state at the Display Panel if the appropriate sensor module is made a digital input sensor.

STATUS PAGE	Controller address, issue no.
TIME PAGE	Controller time/date, seasonal change dates
INPUT PAGE	Sensor measurements and status signals
INTERNAL PAGE	Controller calculated values
KNOB PAGE	User adjusted values - e.g. Setpoints
SWITCH PAGE	User - manual switch actions
DRIVER PAGE	Controller output signal status

3.3   The Display Page (continued)

TIME ZONE PAGE   On/Off time periods 5 zones
OPTIMUM START/STOP System calculated heating/cooling times
CALENDAR PAGE   Holiday settings
ALARM PAGE   Shows up to 20 recorded alarms

3.4   Adjusting a Value

To change a value (e.g a knob):

(1)   Select the required field using the **right** button. This will position the blink (square) cursor on the right hand digit of any adjustable numeric field. If large changes are required use the **left** button to backtrack to the required digit.

(2)   Use the **up** button to increment the entry, and the **down** button to decrement the entry. The cursor will change from blink to underline whilst a value is being changed. Five seconds after the **up** or **down** button is released the blinking cursor returns indicating that the new value has been accepted by the controller. If the cursor is moved from the value then the value is immediately entered into the controller.

If the value is password protected then the display will change to a page requesting the entry of a valid PIN, 'Enter your PIN ****', the cursor being positioned on the first digit of the PIN. Set up the first digit using the **up** or **down** button, followed by the **right** button to select the next digit. Once all four digits have been entered, pressing the **right** button again will cause the controller to verify the PIN. If a valid password has been entered, the item display page will return with the cursor now set to an underline. The value can then be changed by the **up/down** button as appropriate.

Once a valid password is entered, all items at or below that password level may be altered. The password will time-out two minutes after the last key was pressed.

If an invalid password is entered, the Display Panel prompts 'Edit Inhibited'. No changes can then be made.

USING THE DISPLAY PANEL

3.5 Programming the Soft Buttons

The buttons labelled **A**, **B**, **C**, and **D** provide quick access to four pre-programmed items which are frequently monitored or changed e.g. setpoint adjustments and time control, etc. The buttons are programmed as follows:

(1)   Select the required display and position the cursor on the value which will be required to be changed.

(2)   Hold down the required programmable button, initially the display will change to the previously programmed selection. After approximately five seconds the display will revert to the new selection unless the entry of a PIN is required. In this case the request 'Enter your PIN ****' will appear and a valid PIN must be entered before the new selection is accepted, otherwise the Display Panel prompts "Edit Inhibited" and the display will change to the previously programmed selection. Subsequently, short presses of this button will select the newly programmed page with the cursor set in the position defined.

3.6 PIN/Password Levels

When changing values in a controller the following parameters have fixed PIN/ Password levels:

Knobs	0 - 100 as set during configuration
Switches	0 - 100 as set during configuration
Addresses	90
Time and Date	50
Seasonal Time changes	50
Zone times (Current week)	30
Zone times (Standard week)	50
Holiday date	50
Holiday time	70
Reprogram soft keys	90

When an attempt is made to change a protected parameter, the user must enter a four digit PIN which has previously been set up in the controller to have a priority level above that for the selected item as shown above. If the PIN is valid, the change can be made, but if not valid, the change will be inhibited. Once a valid password is entered, it will enable changes for items equal to or below its priority level. It will time-out two minutes after the last button is pressed.

3.7   Display Page - terminology used in examples

An example of each type of display page is included in sections 3.8 to 3.20. Displayed information is described using the following terms:

Row - may be 1 or 2 and relates to the upper or lower row of the display.

Field - is the reference number of a section of a display page.

Length - is the the maximum number of characters that can exist in a data field.

Monitor only - indicates that the data in this field is a variable value, which cannot be changed by the operator.

Fixed Label - indicates a label which is determined by the program, which cannot be changed.

USING THE DISPLAY PANEL

3.8 Status Display Page

The Status Display page, shown below, shows the identity of the currently connected controller, and allows modification of the controller address or the destination address for alarms.

```
STATUS FRIDGE PACK 2 Address 20 DATA OK
ALARM  1   on LAN  0 Text off IQ220 2.0
```

Row	Field	Description	Length	Comments
1	1	'Status'	6	Change to select new display page
	2	Label	15	15 characters controller identifier - can be changed in configuration mode
	3	'Address'	7	Fixed label
	4	address	3	Address of controller.
	5	Dynamic Data State	5	*Flashes DATA OK (when working correctly), or DATA ERROR (in case of HELP alarm). Monitor only.
2	6	'Alarm'	5	Fixed label
	7	Alarm Address	3	Node address of target supervisor to which alarms are to be sent. 0 = no reporting. 2 = direct connected supervisor interface.
	8	'on LAN'	6	Fixed label
	9	LAN address	3	LAN number to which alarms are to be sent. 0 = local LAN or auto-dialled via ANC+ on local LAN
	10	Text alarms	8	Toggle between Text alarms 'Text On' and normal alarms 'Text Off' selection.
	11	'IQxxx'	5	Fixed label
	12	Version	3	Software (firmware) issue in the format X.X. Monitor only.

*   DATA OK - non alarm condition

DATA ERROR - an alarm condition generated when a HELP alarm exists within the controller. (See Section 3.18)

3.9 Time Display Page

The Time Display page, shown below, allows the operator to monitor or change the current time and date, or the Seasonal Time change data.

```
Time 15:36 TUE 17JAN88
on by  1 hour on 21APR  back on 21OCT
```

Row	Field	Description	Length	Comments
1	1	'Time'	4	Change to select new display page
	2	Time	5	Time in format HH:MM. Can be changed if valid password entered.
	3	Day of week	3	Three letter code for the day of the week. Can be changed if valid password is entered.
	4	Date	7	Date in format dd.mmm.yy. Where dd is the day date (2 digits), mmm is the month (3 letters) and yy is the year (2 digits). Can be changed if valid password is entered.
2	5	'on by'	5	Fixed label
	6	change by	1	Amount of seasonal time change in hours. Can be changed if valid password is entered.
	7	'hour on'	7	Fixed label
	8	Date	5	Date in format dd.mmm. Where dd is the day date (2 digits), and mmm is the month (3 letters). Can be changed if valid password is entered.
	9	'back on'	7	Fixed label
	10	Date	5	Date in form dd.mmm. Where dd is the day date (2 digits), and mmm is the month (3 letters). Can be changed if valid password is entered.

3.10   Sensors Display Page (IQ2xx Series & IQ151+)

Note that IQ1xx Series Controllers (except IQ151+) have Inputs and Internal pages instead of Sensors and Digital Inputs.

External sensors measure plant levels external to the system (e.g. temperature and humidity). Internal sensors are values derived within the controller.

```
 Sens  1 OUTSIDE AIR        14.1 DEGC
         SENSOR FAIL       External
```

Row	Field	Description	Length	Comments
1	1	Sens	4	Change to select item
	2	Sensor No	2	Change to select sensor No.
	3	Label	20	Edit in configuration mode.
	4	Values	6	Monitor only
	5	Units	4	Edit in configuration mode.
2	6	Alarm	11	Flashing display of Alarm condition.
	7	Int/Ext	8	Whether sensor is INTERNAL or EXTERNAL. Can be changed in configuration mode.

3.11　　Digital Inputs Display Page (IQ2xx Series & IQ151+)

*Note that IQ1xx Series Controllers (except IQ151+) have Inputs and Internal
pages instead of Sensor and Digital Inputs.*
External Digital inputs are status inputs (i.e. ON or OFF) coming from outside
the controller, whereas internal digital inputs are derived internally.

```
Digin 10 Boiler 1       ON
                        External
```

Row	Field	Description	Length	Comments
1	1	Digin	5	Change to select item
	2	Digin No	2	Change to select Digin No.
	3	Label	20	Edit in configuration mode.
	4	Values	3	Monitor only
2	5	Alarm	10	Flashing display of Alarm condition.
	6	Internal	8	Whether digin is INTERNAL or EXTERNAL. Can be changed in configuration mode

USING THE DISPLAY PANEL

3.12   Knob Display Page

3.12.1   Knob adjustment of Analogue Node

A Knob is a value that can be adjusted by the operator. It can either be an adjustment to an analogue node e.g. a setpoint or a limit, or it can be an adjustment of a module parameter e.g. loop gain.

```
 KNOB  1 OCCUPIED SETPOINT    20.5 DEGC
          MINIMUM 15.0  MAXIMUM 35.0
```

Row	Field	Description	Length	Comments
1	1	'Knob'	6	Change to select new display page
	2	Knob No.	2	Change to select knob number
	3	Label	20	Edit in configuration mode
	4	Value	6	Value can be changed if valid password is entered.
	5	Units	4	Edit in configuration mode
2	6	'Minimum'	7	Fixed label
	7	min Value	6	The lower limit of the range over which the knob may be adjusted. This can be edited in configuration mode.
	8	'Maximum'	7	Fixed label
	9	max Value	6	The upper limit of the range over which the knob may be adjusted. This can be edited in configuration mode.

3.12 Knob Display Page (continued)

3.12.2 Knob adjustment of Module Parameter Id

```
KNOB 21  FLOW TEMP ALARM  25.0 DEGC
S19H H alarm  25.0  (+/-32.767)
```

Where the knob has been configured to change a module parameter the display page changes as follows:

Row 1 is unchanged
Row 2 provides the following fields

Row	Field	Description	Length	Comments
2	6	parameter Id string	4	This is the normal configuration mode identity for the parameter to be changed.
	7	*Configuration display	-	This is the normal text used to identify the parameter and its value in configuration mode.
	8	*Configuration Range	-	This is the normal permitted range of the adjustment in configuration mode.

*These two items come from the configuration mode display for the module affected and confirm the change in the module itself. They will not be displayed if the controller is in configuration mode, (e.g. another user is configuring the controller). In this mode the value cannot be displayed and the legend 'Utility Busy' will be shown.

USING THE DISPLAY PANEL

3.13　　Switches Display Page

A switch is a status (i.e. ON or OFF) that can be changed by the operator (e.g. Summer/Winter switch).

```
Switch  1 MANUAL OVERRIDE    ON
```

Row	Field	Description	Length	Comments
1	1	'Switch'	6	Change to select new display page
	2	Switch No.	2	Change to select switch number
	3	Label	20	Edit in configuration mode
	4	State	3	Current state - ON or OFF can be changed if a valid password is entered.

3.14 Driver Display Page

```
Driver  1 Radiant Heater       32.2%
INVERTED O/P  1 O/P  2   ON    READBAK
```

A Driver is the output module of the controller. Six types of Driver modules exist as follows:

Driver type	Current State of Driver (Row 2 - Field 6)
digital output	Inverted
analogue output	Inverted
time proportional	Inverted
raise/lower	Raise, Lower, Static
binary switch	Inverted
time proportional and override	Inverted, Override

Row	Field	Description	Length	Comments
1	1	'Driver'	6	Change to selec new display page
	2	Driver No.	2	Change to select dirver number
	3	Label	20	Edit in configuration mode
	4	Value	6	Monitor only. Value of input, ON/OFF for digital driver.
	5	'%'	1	Fixed label
2	6	State	8	Current state of driver. Will be empty or display 'Inverted, Raise, Lower, Static or Override' as shown in the list above.
	7	'O/P1'	6	Fixed label. Only shown if in-phase output chanel is set up.
	8	State	3	In-phase output channel state (ON/OFF) or level for analogue. (0-100%) For TP+0 100% = override 70% = off 40% = on
	9	'O/P2'	3	Fixed label only shown if anit-phase output channel set up.
	10	State	3	Anti-phase output channel state (ON/OFF)

USING THE DISPLAY PANEL

3.14 Driver Display Page (continued)

Row	Field	Description	Length	Comments
2	11	Driver	7	This display will alternate between ALARM and either READBACK or SERVICE if either of the alarms are present. The display will cycle between ALARM, READBACK, and SERVICE, if both alarms are present. If no alarm will be blank.

* **READBACK ALARM** - failure of the Plant to execute function, detected by readback data, from the plant.

SERVICE ALARM - generated when maintenance interval has been exceeded. Normally pre-programmed maintenance interval for driven pumps and other ancillary equipment.

3.15   Zone Display Page

A time zone is an area of the building or its plant which operates a common time schedule. It defines the building occupation start and stop times.

```
ZONE  2 MEAT PREP- AREA    NEXT  THR
07:30to12:30 13:30to18:00 24:00to24:00
```

Row	Field	Description	Length	Comments
1	1	'Zone'	4	Change to select new display page
	2	Zone number	1	Change to select zone number
	3	Label	20	Edit in configuration
	4	Week type	6	'Next' refers to current week.
				'Every' refers to standard week.
				Toggle with up and down keys.
	5	Day of Week	4	Change to select day of week
2	6	Period 1 start	5	Change to select new Period 1 start time. Password protected.
	7	'to'	5	Fixed label
	8	Period 1 stop	5	Change to select new Period 1 stop time. Password protected.
	9	Period 2 start	5	Change to select new Period 2 start time. Password protected.
	10	'to'	5	Fixed label
	11	Period 2 stop	5	Change to select new Period 2 stop time. Password protected.
	12	Period 3 start	5	Change to select new Period 3 start time. Password protected.
	13	'to'	5	Fixed label
	14	Period 3 stop	5	Change to select new Period 3 stop time. Password protected.

Note: Immediately after selection of this display page, the day displayed will be the current day in the current week.
Note: If a period's start and stop times are equal (e.g. 24:00 to 24:00), it is a period of non-occupation.
Note: A change made to the Every week (standard week) will also update the corresponding day in the Next week (current week) at the next midnight (see IQ Configuration Manual 'Zone Times').

USING THE DISPLAY PANEL

3.16   Optimum Start/Stop Display Page

Optimum start/stop applies to a particular time zone. It calculates the optimum start so that the zone reaches occupation temperature by the zone occupation start time.

```
OSS ZONE  2   VESTRY
LAST START 07:31 NEXT STOP 12:13 HEATING
```

Row	Field	Description	Length	Comments
1	1	'OSS Zone'	8	Change to select new display page
	2	Zone number	1	Change to select OSS zone number
	3	Label	20	Edit in configuration mode
2	4	Start time label	10	Next/Last start. 'Next Start' between end of occupation and optiumum start, otherwise, 'Last Start'. Monitor only.
	5	Start time	5	Time in HH:MM. Monitor only.
	6	Stop time label	9	Next/Last start. 'Next Stop' between end of occupation and optiumum start, otherwise, 'Last Stop'. Monitor only.
	7	Stop time	5	Time in HH:MM. Monitor only.
	8	OSS state	7	Current OSS Zone state Heating/Cooling/OFF. Monitor only.

3.17 Calendar Display Page

The calendar page, shown below, defines up to 20 periods during which special operating times are used (e.g. holidays). On each of these dates, each zone's times are defined.

```
Calendr 5 Next 25Dec-27Dec Zone 1 Spec 1
07:30to11:30 24:00to24:00 24:00to24:00
```

Row	Field	Description	Length	Comments
1	1	Calendar	7	Change to select new display page
	2	Holiday No	2	Change to select holiday number
	3	Holiday status	4	Status can be Next/Free/Each.
				Next: means the holiday will appear on the next occurrence of that date, then automatically becomes Free status.
				Free: means holiday will not occur. Each: means holiday will occur each year on the specified date. Can be changed if valid password is entered.
	4	Start Date	5	Select day by number, then month as a three letter label by stepping through.
	5	Stop Date	5	Select day by number, then month as a three letter label by stepping through.
	6	'Zone'	4	Fixed label
	7	Zone number	1	Change to see/set-up times for that zone on holiday selected.
	8	Occupation type	6	Can be changed if valid password is entered. Alternatives are:- Normal Occupation, Unoccupied or Spec (Special) 1 to 5. Normal means time zones are unaffected by holiday dates. Unocc means zone is unoccupied on the holiday date. Spec 1 to 5 means that one of five special patterns of occupation times may be applied to the holiday date. Note: if changes are made to a special day, the changes will be effective wherever that special day's times are used.

3.17   Calendar Display Page (continued)

Row	Field	Description	Length	Comments
2	8	Period 1 start	5	Change to select new period 1 start time. Password protected.
	9	'to'	5	Fixed label
	10	Period 1 stop	5	Change to select new Period 1 stop time. Password protected.
	11	Period 2 start	5	Change to select new Period 2 start time. Password protected.
	12	'to	5	Fixed label
	13	Period 2 stop	5	Change to select new Period 2 stop time. Password protected.
	14	Period 3 start	5	Change to select new Period 3 start time. Password protected.
	15	'to	5	Fixed label
	16	Period 3 stop	5	Change to select new Period 3 stop time. Password protected.

*Note that no occupation times are shown if the occupation type is **Normal Occupation** or **Unocc**.*

3.18   Alarm History Display Page

Alarm History is a record of the 20 most recent alarms in chronological sequence. Where alarm 20 is the most recent, alarm 19 preceeds alarm 20 and so on. The display provides time, date, and alarm type information. The label of alarm type is displayed in the language configured for the Display Panel

```
ALARM  3 SENSOR 12 BOILER FLUE TEMP
CLEAR HIGH ALARM  17:27 THR 14AUG88
```

Row	Field	Description	Length	Comments
1	1	'Alarm'	5	Change to select new display page
	2	Alarm Record No	2	Change to select alarm record
	3	Item type	6	Type of item in alarm, monitor only.
	4	Item number	2	Number of item in alarm, monitor only.
	5	Item Label	20	Label of item in alarm, monitor only.
2	6	'Clear'	5	Label present if clear alarm, monitor only.
	7	Alarm	16	Label of alarm type, monitor only.
	8	Time of Alarm	5	Time alarm occurred, monitor only.
	9	Day of Week	3	Day of Week (3 letters) i.e. Mon-Sun, only.
	10	Date	7	Date of alarm. dd mmm yy. Where dd is the day date (2 digits), mmm is the month (3 letters), and yy is the year (2 digits).

Note that when the operator has selected a specific alarm for display and another alarm occurs, then the same alarm remains displayed but the item number will be seen to change provided that the alarm buffer is not full.

Display defaults to most recent alarm (no. 20).

3.18 Alarm History Display Page (continued)

List of Alarms. (English)	Equivalent alarm code	General alarm Self Test Number
DIGIN ON	DI = 1	
DIGIN OFF	DI = 0	
HIGH VALUE	HIGH	
LOW VALUE	LOW	
SENSOR FAIL	OUTL	
INPUT ERROR	READ	
PV FAIL	PVFL	
DEVIATION	SDEV	
READBACK	SDGT	
SERVICE	MINT	
RESTART	CONL	1
DATA ERROR	HELP	2
PIA FAULT	FPIA	3
CLOCK WRONG	FRTC	4
RAM FAULT	FRAM	5
S'WARE FAIL	FSWR	6
DART FAULT	FDRT	7
EPROM FAULT	FPRM	8
CLOCK WRONG	FTKA	9
CLOCK WRONG	FTKP	10

Alarms

The following is a brief description of each of the alarm types that may appear on the Alarm History page.

DIGIN ON (DI=1), DIGIN OFF (DI=0) Digital Input state differs from required state.

HIGH VALUE an alarm generated when the scaled value received from the sensor exceeds the high limit.

LOW VALUE an alarm generated when the scaled value received from the sensor is less than the low limit.

SENSOR FAIL an alarm generated when the measured value received from the sensor exceeds the normal maximum or minimum values defined by the sensor type.

3.18 Alarm History Display Page (continued)

INPUT ERROR an alarm generated when the measured value received from the sensor is outside the range that can be handled by the controller input circuitry.

PV FAIL Process Variable Fail, generated whenever input information required for a control loop has failed, resulting in the Alarm Fail action being taken.

DEVIATION Deviation Alarm, generated whenever the difference between the sensor value and the setpoint (deviation) is greater than the deviation limit.

READBACK Readback Alarm, generated whenever driver output readback check does not confirm driver output actions.

SERVICE Maintanance Interval expired alarm, generated by control strategy.

RESTART alarm is generated at power up or if the system is restarted, when the data file information has been checked correctly.

DATA ERROR alarm is generated under conditions of data file corruption on power up or if the system has restarted and thereafter whenever an operator communicates in normal supervisor mode (not configuration mode).

CLOCK WRONG Failed Real Time Clock this alarm is generated whenever the alarm condition is found; if the condition remains, the alarm is repeated at one hour intervals.

PIA FAULT, RAM FAULT, S'WARE FAULT, DART FAULT and **EPROM FAULT** these alarms cause a CONL to be generated by restarting the controller program. If the alarm condition is still present after the CONL then the alarm is recorded. These alarms are often due to corruption of a working register by electrical noise, and can be cleared automatically by the outstation resetting itself. Thus they may be ignored unless their frequency interferes with control.

CLOCK WRONG (FTKA) Failed Time Keeper Advice is generated (IQ90s only) when the controller unsuccessfully requests time and date synchronisation after power up or at midnight. If the controller is not connected to a system, or does not receive regular time and date synchronisation then this alarm will be generated at 24 hour intervals at approximately 00:10 hours.

CLOCK WRONG (FTKP) Failed Time Keeper, this alarm is generated (IQ 90s only) after the FTKA.

USING THE DISPLAY PANEL

3.19   Dialler Page (IQ22x/ADL controllers only)

The Dialler page shows the status of the ADL (Autodialling Lite) component of the IQ22x/ADL controller. It is very useful while commissioning the /ADL controller autodial connection.

```
DIALLER  Idle
Tel No:  1
```

Row	Field	Description	Length	Comments
1	1	'Dialler'	7	Change to select item
	2	Status	21	Current status of dialler:
				'Local PC mode'
				'Looking for Modem'
				Idle'
				'No dial tone'
				'Local modem fault'
				'Dialling'
				'No answer far site'
				'Link-Fail'
				'Security Fail'
				'Connected'
				'Local modem ringing'
2	3	'Tel No:'	11	Fixed label
	4	Number	29	Telephone number

The status descriptions are as follows:

Local PC mode: Appears when modem disconnected from back of IQ.

Looking for Modem: Transitory while confirming presence of modem.

Idle: Quiescent state with modem connected to back of IQ.

No dial tone: Unable to dial as local telephone connection missing.

Local modem fault: The local modem has not replied in time (timeout, has an error, or is busy).

Dialling: Dialling out to far site.

No answer far site: Has failed to pick up carrier from far site.

Link-Fail: Incompatible peer (doesn't understand protocol), or protocol timeout.

Security Fail: Mismatch of autodialling passwords between the two sites.

Connected: Connected successfully to far site.

Local modem ringing: Incoming call.

The **Number** field shows the telephone number used when dialling out, or the number of an incoming call as long as the number is set up as own telephone number in the incoming call originator (e.g. TMN).

3.20   Inputs Display Page (IQ1xx Series Controllers except IQ151+)

Note that IQ1xx Series Controllers (except IQ151+) have Inputs and Internal pages instead of Sensors and Digital Inputs.

The inputs display page, shown below, shows the condition of a universal input channel; the displayed value may be either a sensor reading or a plant status (on or off). The type of displayed value depends on the configuration of the sensor module.

```
I/P 11 GROUND FLOOR FOYER  19.5 DEGC
           LOW VALUE                 External
```

Row	Field	Description	Length	Comments
1	1	I/P	4	Change to select new display page
	2	Sensor No.	2	Change to select Sensor No.
	3	Label	18	Edit in Configuration mode
	4	Value	6	Monitor only.
				Digital Input = status.
				Analogue Input = real number value.
	5	Units	4	Edit in Configuration mode
2	6	Alarm	10	*Display of alarm condition HIGH VALUE, LOW VALUE, SENSOR FAIL, INPUT ERROR or DIGIN STATE alternating with ALARM.
	7	Int/Ext	8	Whether sensor is 'internal' or 'external' can be changed in Configuration mode.

*   See Section 3.18 for explanation of alarms

USING THE DISPLAY PANEL

3.21   Internal Display Page (IQ1xx Series Controllers except IQ151+)

Note that IQ1xx Series Controllers (except IQ151+) have Inputs and Internal pages instead of Sensors and Digital Inputs.

The Internal Display page, shown below, shows the condition of internal universal inputs (i.e one whose source is within the controller), the display will be either a value for an internal sensor or a status (on or off) for an internal digital input.

```
INT 17 HEATING DEMAND        99.0%
       HIGH VALUE                  Internal
```

Row	Field	Description	Length	Comments
1	1	'Int'	3	Change to select new display page
	2	Internal No.	2	Change to select internal no.
	3	Label	20	Edit in configuration mode
	4	Value	6	Monitor only.
				Digital Input = Status.
				Analogue Input = real number value.
	5	Units	4	Edit in configuration mode
2	6	Alarm	10	Display of alarm condition HIGH VALUE, LOW VALUE, SENSOR FAIL, INPUT ERROR or DIGIN STATE alternating with ALARM.
	7	'Internal'	8	Fixed label

See section 3.18 for explanation of alarms.

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