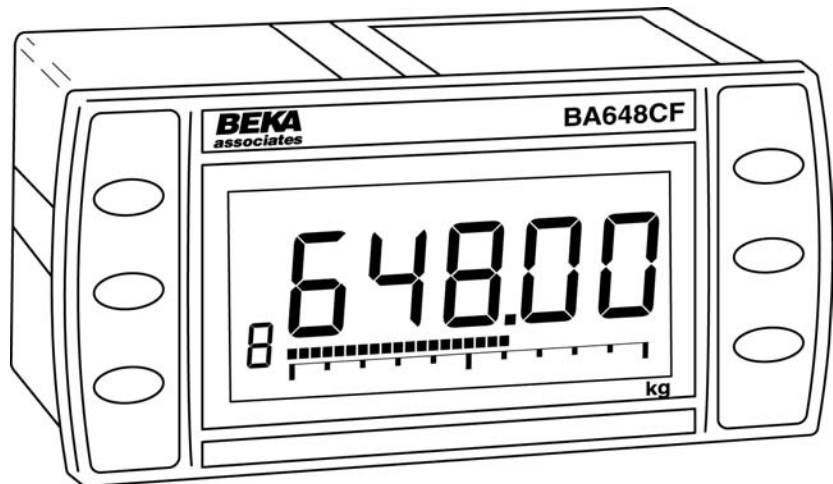


**BA648CF-F**  
**FOUNDATION™ fieldbus**  
**Panel mounting**  
**8 variable**  
**Fieldbus Indicator**  
Issue 3



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## 1. DESCRIPTION

The BA648CF-F fieldbus indicator is a general purpose FOUNDATION™ fieldbus instrument that may be configured as a fieldbus node or as a fieldbus listener. It can display up to eight fieldbus process variables on a five digit LCD and 31 segment analogue bargraph. The instrument is bus powered so no additional power supply is required.

As a fieldbus node the indicator is configured via the fieldbus host.

Communication Protocol	Fieldbus Function Blocks
FOUNDATION™ fieldbus	Input Selector (2 x IS) Digital input (6 x DI)

Device Description files may be downloaded from the Fieldbus Foundation or from the BEKA associates websites.

When configured as a fieldbus listener the BA648CF-F is not visible to the fieldbus host and can only be configured using the push buttons on the front of the instrument.

Housed in a robust 72 x 144 panel mounting DIN enclosure, the BA648CF-F has an IP66 front panel and is supplied with a gasket to seal the joint between the instrument and the panel.

The instrument's communication protocol is shown on the rear of the instrument. The '-F' order code suffix also indicates the protocol but is not shown on the instrument identification label. There is an alternative version of the fieldbus display, order code BA648CF-P for use on PROFIBUS PA networks.

## 2. OPERATION

The BA648CF-F fieldbus indicator can display up to eight pre-configured FOUNDATION™ fieldbus process variables designated in-1 to in-8. The operator can select which variable is displayed using the ▼ and ▲ push buttons which scroll the display through the eight inputs. A numeric annunciator on the left hand side of the display shows which of the eight inputs is currently being displayed.

### 2.1 Error messages

When the BA648CF-F is configured as a listener the following error messages may be displayed:

'no ConF'	No inputs have been configured or are enabled.
'no dAtA'	No data is being received with the current configuration.

## 3. SYSTEM DESIGN

The BA648CF-F FOUNDATION™ fieldbus indicator is powered via the fieldbus which is connected to non-polarised terminals 1 and 2 as shown in Fig 1. The indicator may be connected to any FOUNDATION™ fieldbus segment that can supply an additional 13mA at between 9 and 32V.

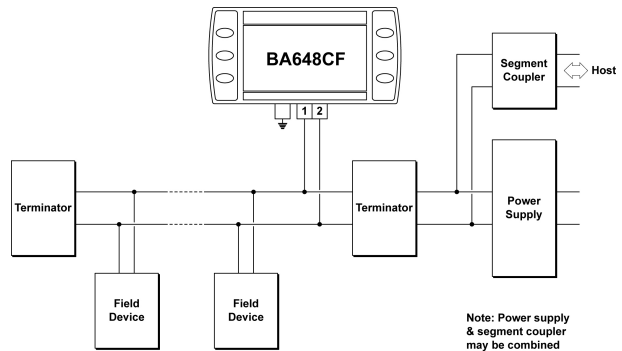


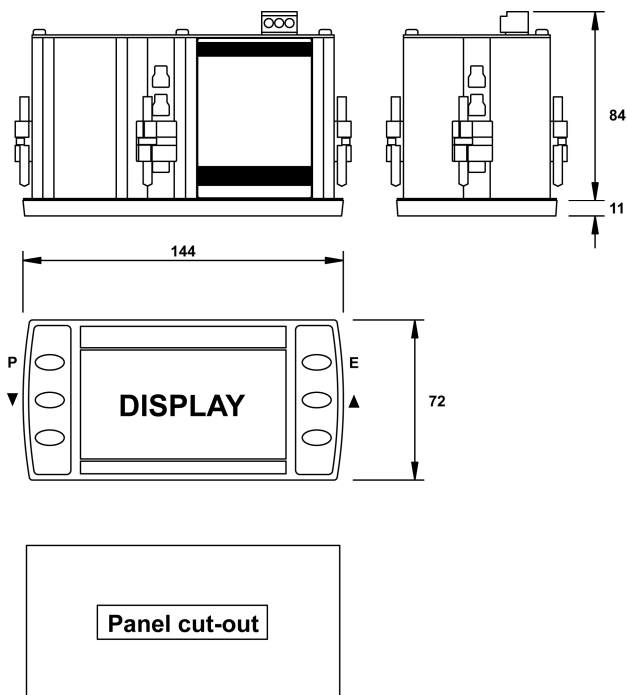
Fig 1 Typical FOUNDATION™ Fieldbus™ segment

## 4. INSTALLATION

### 4.1 Location

The BA648CF-F is housed in a robust aluminium enclosure with a toughened glass window mounted in a Noryl bezel. The front of the instrument provides IP66 protection and a gasket seals the joint between the instrument enclosure and the panel. The instrument may be installed in any panel providing the environmental limits shown in the specification are not exceeded.

Fig 2 shows the overall dimensions of the BA648CF-F and the panel cut-out. To achieve an IP66 seal between the instrument enclosure and the panel, the smaller cut-out must be used and the instrument secured with four panel mounting clips.



#### Cut-out Dimensions

##### DIN 43 700

138.0 +1.0/-0.0 x 68.0 +0.7/-0.0

**To achieve an IP66 seal  
between instrument enclosure  
and panel**

136.0 +0.5/-0.0 x 66.2 +0.5/0.0

Fig 2 BA648CF-F dimensions

### 4.2 Installation Procedure

- Insert the BA648CF-F into the instrument panel cut-out from the front of the panel.
- Fix panel mounting clips to opposite sides of the instrument and tighten until the instrument is secure. Four clips are required to achieve an IP66 seal between the instrument enclosure and the panel.
- Connect the panel wiring to the rear terminal block as shown in Fig 3. To simplify installation, the terminals are removable so that panel wiring can be completed before the instrument is installed.

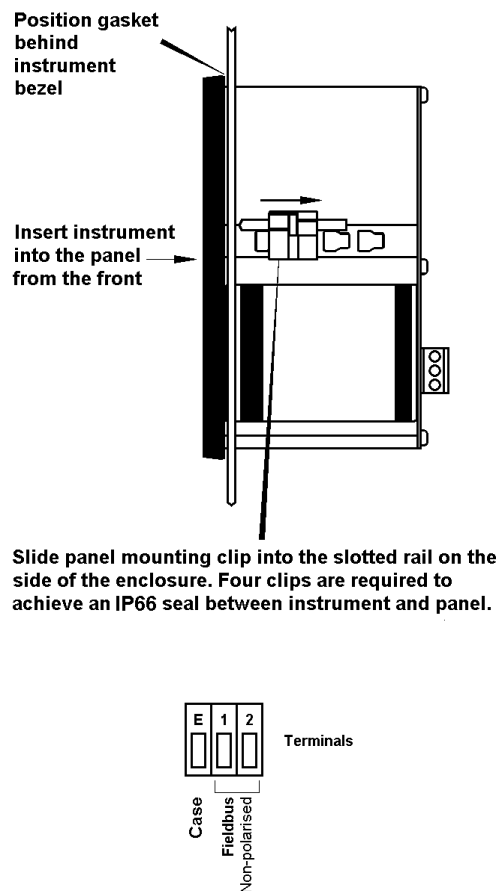


Fig 3 Installation and terminal connections

### 4.3 EMC

The BA648CF-F complies with the requirements of the European EMC Directive 2004/108/EC. For specified immunity, all wiring should be in screened twisted pairs with the screens earthed at one point.

## 5. CONFIGURATION

The BA648CF-F 8 variable FOUNDATION™ fieldbus indicator may be configured as a fieldbus node or as a fieldbus listener. When used as a fieldbus node the indicator is configured via the fieldbus host. For detailed node conditioning information please refer to the BEKA FOUNDATION™ fieldbus Interface Guide which may be downloaded from [www.beka.co.uk](http://www.beka.co.uk)

As a fieldbus listener the BA648CF-F is not visible to the fieldbus host and can only be configured via the front panel push buttons using the menu shown in Fig 6.

Throughout this manual the four BA648CF-F push buttons are identified **P** **E** **▼** **▲** and legends displayed by the fieldbus indicator are shown within inverted commas e.g. 'CodE' and 'LiSt'.

### 5.1 Configuration menus

The configuration menu is separated into two sections, fieldbus node and fieldbus listener. Both contain the 'tYPE' function that enables transfer between the two. Unless otherwise requested when ordered, all FOUNDATION™ fieldbus BA648CF-F indicators are supplied as fieldbus nodes but can easily be reconfigured on-site.

### 5.2 Node configuration menu

The node configuration menu is shown in Fig 4. Access to the menu is obtained by operating the **P** and **E** buttons simultaneously. If the BA648CF-F is not protected by an access code the first parameter 'rESEt' will be displayed\*. If the instrument is protected by an access code, 'CodE' will be displayed first. Pressing **P** will allow the four digit security code to be entered digit by digit using the **▼** or **▲** button to adjust the flashing digit and **P** to move control to the next digit. When the correct code has been entered, pressing **E** will cause the first parameter 'rESEt' to be displayed\*. If an incorrect code is entered, or no button is pressed for ten seconds, the BA648CF-F will automatically return to the display mode.

\* If the indicator displays 'SCAn' it is conditioned as a fieldbus listener, see section 5.3.13 to change it to a fieldbus node.

### 5.2.1 Reset the indicator to node factory defaults 'rESEt'

The BA648CF-F may be reset to the factory defaults that are shown below:

Security Code	0000 (disabled)
Device address	Unconfigured
Last variable	8

For each of the eight inputs:

Decimal point	XXX.XX
Bar Type	Left
Bar lower limit	0.0
Bar Upper limit	100.0
Gain	1.0
Offset	0.0

To reset the BA648CF-F select 'rESEt' in the configuration menu by operating the **▼** or **▲** button. To enter the function press **P** which will reveal '0000' with the left hand digit flashing. To prevent accidental use of this function, '5urE' must be entered to confirm that the instrument is to be reset.

Using the **▼** or **▲** button set the flashing digit to '5' and press the **P** button to move control to the next digit which should be set to 'u'. When the four letters of '5urE' have been entered operating the **E** button will reset the BA648CF-F to the factory defaults.

#### CAUTION

**All the instrument's node configuration and links will be lost when it is reset.**

### 5.2.2 Change from node to listener 'tYPE'

This function enables the instrument to be changed from a fieldbus node to a fieldbus listener. Select 'tYPE' in the node configuration menu using the **▼** or **▲** button. To enter the function press **P** which will show that the instrument is configured as a fieldbus node, to change to a fieldbus listener press the **▼** or **▲** button which will toggle the display to 'LStnr'. To prevent accidental changes this request must be confirmed by operating the **P** button and entering '5urE'. The instrument will display '0000' with the first digit flashing, using the **▼** or **▲** button set the flashing digit to '5' and press the **P** button to move control to the next digit which should be set to 'u'. When the four letters of '5urE' have been entered, operating the **E** button will cause the instrument to restart as a fieldbus listener in the display mode.

#### CAUTION

**All the instrument's node configuration and links will be lost when it is changed from a fieldbus node to a fieldbus listener.**

### 5.2.3 Access code for node configuration menu 'CodE'

Access to the node configuration menu may be protected by a four digit security code which must be entered to gain access. New instruments are supplied configured with the default code 0000 which disables this protection and allows unrestricted access to the configuration menu.

To enter a new access code select 'CodE' in the configuration menu by operating the ▼ or ▲ button. To enter the function press P which will reveal the current access code with one digit flashing. The code may be changed using the ▼ or ▲ button to adjust the flashing digit and the P button to move control to the next digit. When the required code has been selected, press E to enter the selection and return to the 'CodE' prompt in the configuration menu. The revised access code will be activated when the indicator is returned to the display mode.

If the access code is lost please contact BEKA associates.

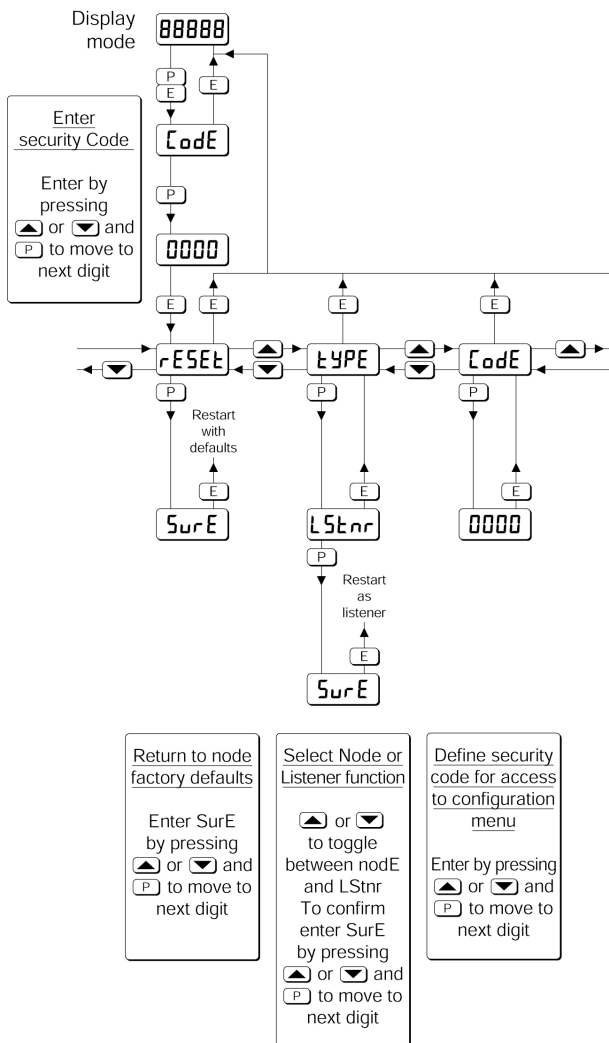


Fig 4 Node configuration menu

### 5.3 Listener configuration menu

The listener configuration menu is separated into three sections, 'SCAN', 'LIST' and 'Edit', plus three housekeeping functions 'CodE', 'tYPE' and 'rESEt' as shown in Fig 6.

'SCAN' is the simplest method of configuration if the fieldbus Device Address and Variable Identity of the data to be displayed by the BA648CF-F listener are not known.

In the 'SCAN' function pressing the P button causes the BA648CF-F indicator to search the fieldbus segment to which it is connected for all publishers. Fig 5 shows how the indicator displays the hexadecimal Device Address and Variable Identity associated with each publisher.

A **Publisher** is a device that places its output data onto the bus as part of a cyclical pre-determined data exchange schedule.

The **Device Address** is a unique address that identifies each fieldbus instrument connected to the bus.

The **Variable Identity** is the fieldbus device Data Link Connection End Point (DLCEP) which identifies each Function Block output (process variable) transmitted by a fieldbus device such as flow and temperature transmitted by a fieldbus flowmeter.

The ▼ and ▲ push buttons scroll the display through all the publishers on the segment showing the Device Address and Variable Identity for each one - see Fig 5. To aid identification, operating the P button will preview the value of the data at each selected address, if required it may then be allocated to one of the eight BA648CF-F listener inputs in-1, to in-8 by operating the P button again. If the format of the data at the selected Device Address and Variable Identity is not DS-65 (float + status) 'no dAt' will be displayed.

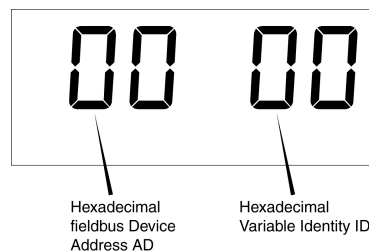


Fig 5 Device Address and Variable Identity

If the Device Address and Variable Identity of the process variable to be displayed by the BA648CF-F indicator are known, they may be directly entered via the edit sub-menu. This sub-menu also provides full control of both the numeric and bargraph display parameters.

### 5.3.1 Access

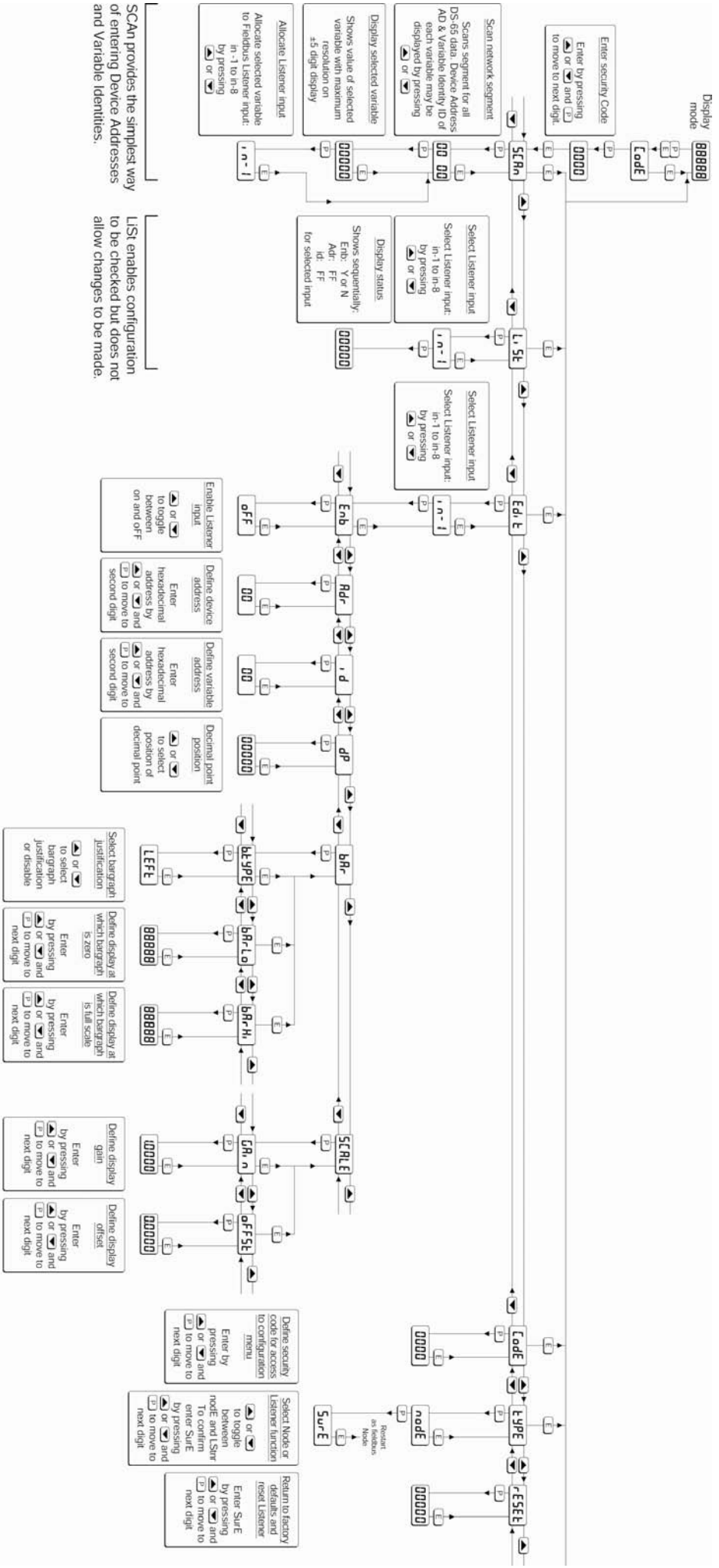
Access to the listener configuration menu is obtained by operating the **P** and **E** buttons simultaneously. If the BA648CF-F is not protected by an access code the first parameter 'SCAN' will be displayed.\* If the indicator is protected by an access code, 'CodE' will be displayed first. Pressing **P** will allow the four digit security code to be entered digit by digit using the ▼ or ▲ button to adjust the flashing digit and **P** to move control to the next digit. When the correct code has been entered, pressing **E** will cause the first parameter 'SCAN' to be displayed.\* If an incorrect code is entered, or no button is pressed for ten seconds, the indicator will automatically return to the display mode.

\* If the indicator displays 'rESET' it is conditioned as a fieldbus node, see section 5.2.2 to change it to a fieldbus listener.

### 5.3.2 Summary of listener configuration functions.

This section contains a summary of all the listener configuration functions including a reference to more detailed information. It should be read in conjunction with Fig 6.

Indicator display	Summary of function
'SCAN'	<b>Scan fieldbus segment</b> Identifies all publishers on the fieldbus segment to which the listener is connected and enables selected data to be allocated to one of the eight listener inputs. See section 5.3.3
'LiSt'	<b>List configured input parameters</b> For each of the eight BA648CF-F listener input, in-1 to in-8 shows if the input is enabled and the allocated Device Address and Variable Identity. Parameters can not be changed from within this function. See section 5.3.4
'Edit'	<b>Enter addresses and display parameters</b> Contains six sub-functions that enable known fieldbus Device Address and Variable Identity to be entered and all display parameters adjusted for each of the eight fieldbus listener inputs. See section 5.3.5
'Enb'	<b>Enable listener input</b> Each of the eight listener inputs in-1 to in-8 may be enabled or disabled without affecting any parameters. See section 5.3.6
'Adr'	<b>Enter fieldbus Device Address</b> Allows hexadecimal fieldbus device address for each of the eight listener inputs in-1 to in-8 to be entered. See section 5.3.7
'id'	<b>Enter Variable Identity</b> Allows hexadecimal Variable Identity for each listener input in-1 to in-8 to be entered. See section 5.3.8
'dP'	<b>Decimal point position</b> Defines position of displayed decimal point for each listener input in-1 to in-8. See section 5.3.9
'bAr'	<b>Configuration of bargraph display.</b> Defines bargraph type, plus digital display at which bargraph is zero and full scale for each listener input in-1 to in-8. See section 5.3.10
'SCALE'	<b>Scale numeric display</b> Applies zero offset and scale factor to the numeric display for each listener input in-1 to in-8. See section 5.3.11
'CodE'	<b>Access code for listener configuration menu</b> Enters a four digit security access code for configuration menu. Default code 0000 disables this function. See section 5.3.12
'tYPE'	<b>Change from listener to node</b> Changes the function of the fieldbus indicator from a listener to a node. See section 5.3.13
'rESET'	<b>Reset</b> Returns the BA648CF-F listener to factory defaults. See section 5.3.14



SCAN provides the simplest way of entering Device Addresses and Variable Identities.

LST enables configuration to be checked but does not allow changes to be made.

Edit allows Device Addresses and Variable Identities to be entered in hexadecimal and all parameters to be adjusted.

Fig 6 Listener Configuration menu



### 5.3.3 Scan fieldbus segment 'SCAN'

If the Device Address and Variable Identity of a process variable are not known, the 'SCAN' function provides a simple way to identify them. This function scans the fieldbus segment to which the BA648CF-F indicator is connected and identifies all the publishers. To aid identification it enables the value of each process variable to be pre-viewed and, if required, allocated to one of the eight BA648CF-F Fieldbus indicator inputs.

The BA648CF-F indicator only supports DS-65 formatted data (float + status) which is the usual format for analogue process variables. The 'SCAN' function will identify all publishers on the segment irrespective of format, but when pre-viewed, non DS-65 formatted data will produce a 'no dAt' error message.

'SCAN' is the first function displayed when entering the listener configuration menu, or it may be selected from within the menu by operating the ▼ or ▲ button. To scan the fieldbus segment to which the indicator is connected for all published data press **P** which will reveal the hexadecimal Device Address and Variable Identity of the first publisher found as shown in Fig 5. If there is more than one publisher operating the ▼ or ▲ button will scroll through all of them.

If no cyclic data is being published on the fieldbus segment the BA648CF-F indicator will display 'noPub'.

When the Device Address and Variable Identity of a process variable is being displayed, pressing **P** will preview the value of the process variable displayed with maximum resolution on the five digit display. If this confirms that it is one of the process variables to be displayed, it may be allocated to one of the eight BA648CF-F listener inputs in-1 to in-8.

To select the required listener input press **P** to display the first input in-1, operating the ▼ or ▲ button will scroll the display through the other inputs. When the required input is displayed pressing **E** will allocate the selected process variable to the selected input and return the display to the Device Address and Variable Identity from which another process variable may be selected.

When a process variable is allocated to a indicator input any previous allocation will be overwritten.

### 5.3.4 List configured input parameters 'LiSt'

The 'LiSt' function enables the Device Address and Variable Identity allocated to each lindicator input to be viewed without danger of it being accidentally changed.

The 'LiSt' function may be selected from within the menu by operating ▼ or ▲ button. To enter the function press **P** which will display the indicator input currently selected in the display mode, other inputs may be selected using the ▼ or ▲ button. Operating the **P** button will cause the following parameters for the selected input to be displayed sequentially:

Display	Explanation
'Enb: Y or N'	Input Enabled yes or no
'Adr: 00'	Device Address
'id: 00'	Variable Identity

The display then automatically returns to the selected BA648CF-F indicator input from where another input may be selected.

If one of the eight BA648CF-F indicator's inputs in-1 to in-8 has not had a Device Address and Variable Identity allocated to it, 'LiSt' will show both as invalid address FF.

### 5.3.5 Enter address & display parameters

#### 'Edit'

The 'Edit' function may be selected from within the menu by operating ▼ or ▲ button. To enter the function press **P** which will display the indicator input currently selected in the display mode, other listener inputs may be selected using the ▼ or ▲ button. When the required input has been selected operating the **P** button will enter the edit sub-menu at 'Enb' for the selected input.

### 5.3.6 Enable selected input 'Enb'

'Enb' turns the indicator input selected in the Edit function on or off without affecting the conditioning. To enter the function press **P** which will reveal whether the selected input is 'on' or 'oFF'. Operating the ▼ or ▲ buttons will toggle between the two conditions. When set as required operating the **E** button will enter the selection and return to the edit sub-menu.

### 5.3.7 Enter Device Address 'Adr'

This function allows a known fieldbus Device Address to be entered and allocated to the indicator input selected in the Edit function. To enter the function press **P** which will reveal the existing two digit hexadecimal address with one digit flashing which may be changed by operating the ▼ or ▲ button. When set as required operating the **P** button will transfer control to the second digit that may be adjusted in the same way. When both digits are set as required operating the **E** button will enter the selection and return to the 'Adr' prompt in the edit sub-menu.

### 5.3.8 Enter Variable Identity 'id'

Enables a known Variable Identity to be entered and allocated to the indicator input selected in the Edit function. To enter the function press **P** which will reveal the existing two digit hexadecimal address with one digit flashing which may be changed by operating the ▼ or ▲ button. When set as required operating the **P** button will transfer control to the second digit that may be adjusted in the same way. When both digits are set as required operating the **E** button will enter the selection and return to the 'id' prompt in the edit sub-menu.

### 5.3.9 Decimal point position 'dP'

Defines the position the decimal point in the numeric display. To enter the function press **P** which will reveal the existing decimal point position. Operating the ▼ or ▲ button will move the decimal point to the required position, omit it, or activate all the decimal points which automatically provides maximum resolution in the display mode irrespective of the numeric value. When positioned as required, operating the **E** button will enter the selection and return to the 'dP' prompt in the edit sub-menu.

### 5.3.10 Configuration of bargraph display 'bAr'

This function contains three sub-functions that enable the bargraph, justify its position and define the relationship between the bargraph and the instrument's numeric display.

Sub-function 'b.tYPE' allows the bargraph to be left, centre or right justified, or to be turned off. Sub-functions 'bArLo' and 'bArHi' define the listener's numeric display at which the bargraph starts and is at full scale.

The 'bAr' function may be selected from within the edit sub-menu by operating the ▼ or ▲ button. To enter the function press **P** which will display the 'b.tYPE' sub-function, pressing **P** again will reveal the existing bargraph justification.

The ▼ or ▲ button will scroll through the four options, when the required justification is displayed, pressing **E** will enter the selection and return the display to the 'b.tYPE' prompt in the edit sub-menu from which 'bArLo' may be selected using the ▼ or ▲ button.

'bArLo' defines the indicator's numeric display at which the bargraph starts, to enter the function press **P** which will reveal the existing setting. The display may be changed using the ▼ or ▲ button to adjust the flashing digit and the **P** button to move control to the next digit. When the required starting display has been selected, press **E** to return to the 'bArLo' prompt in the edit sub-menu from which the 'bArHi' function may be selected.

'bArHi' defines the indicator's numeric display at which the bargraph is full scale, to enter the function press **P** which will reveal the existing setting. The display may be changed using the ▼ or ▲ button to adjust the flashing digit and the **P** button to move control to the next digit. When the required display has been selected, press **E** twice to enter the new values and return to the 'bAr' prompt in the edit sub-menu.

**Note:** If the 'dP' function has been set to provide automatic maximum resolution irrespective of the displayed value, it may be necessary to manually position the decimal point before adjusting 'bArLo' or 'bArHi'. This can be achieved by repeatedly operating the **P** button until the activated decimal point flashes, the decimal point can then be positioned using either the ▼ or ▲ button. Pressing the **P** button again will return control to one of the digits.

### 5.3.11 Scale numeric display 'SCALE'

A scaling factor 'Gain' and an offset 'oFFSt' may be applied to the fieldbus process variable using this function, thus allowing the indicator to display the fieldbus process variable in alternative units.

The 'SCALE' function may be selected from within the edit sub-menu by operating the ▼ or ▲ button. To enter the function press **P** which will display the 'GAin' sub-function, pressing **P** again will reveal the existing gain with one digit flashing. This flashing digit may be changed by operating the ▼ or ▲ button; when adjusted the **P** button will move control to the next digit or to the decimal point which can be positioned using the ▼ or ▲ button. When 'GAin' has been set to the required value operating the **E** button will enter the selection and return to the 'GAin' prompt in the sub-menu from where the 'oFFSt' function can be selected using the ▼ or ▲ button.

To enter the 'oFFSt' function press **P** which will reveal the existing offset with one digit flashing. Again the flashing digit may be changed by operating the ▼ or ▲ button and the **P** button will move control to the next digit or to the decimal point. When 'oFFSt' has been set to the required value operating the **E** button will enter the selection and return to the 'oFFSt' prompt in the sub-menu. Three operations of the **E** button will return to the 'Edit' function in the listener configuration menu.

### 5.3.12 Access code for listener configuration menu. 'CodE'

Access to the listener menu may be protected by a four digit security code which must be entered to gain access. New instruments are supplied configured with the default code 0000 which disables this protection and allows unrestricted access to the configuration menu.

To enter a new access code select 'CodE' in the listener configuration menu by operating the ▼ or ▲ button. To enter the function press **P** which will reveal the current access code with one digit flashing. The code may be changed using the ▼ or ▲ button to adjust the flashing digit and the **P** button to move control to the next digit. When the required code has been selected, press **E** to enter the selection and return to the 'CodE' prompt in the listener configuration menu. The revised access code will be activated when the indicator is returned to the display mode.

If the access code is lost please contact BEKA associates.

### 5.3.13 Change from listener to node 'tYPE'

This function enables the instrument to be changed from a fieldbus listener to a fieldbus node by selecting 'tYPE' in the listener configuration menu using the ▼ or ▲ button. To enter the function press **P** which will show that the instrument is configured as a fieldbus listener, to change to a fieldbus node press the ▼ or ▲ button which will toggle the display to 'nodE'. To prevent accidental changes this request must be confirmed by operating the **P** button and entering '5urE'. The instrument will display '0000' with the first digit flashing, using the ▼ or ▲ button set the flashing digit to '5' and press the **P** button to move control to the next digit which should be set to 'u'. When the four letters of '5urE' have been entered, operating the **E** button will cause the instrument to restart as a fieldbus node in the display mode.

#### CAUTION

**All the instrument's listener configuration will be lost when it is changed from a fieldbus listener to a fieldbus node.**

### 5.3.14 Reset the indicator to listener factory defaults 'rESEt'

The BA648CF-F indicator may be reset to the listener factory defaults shown below:

Security Code	0000 (disabled)
---------------	-----------------

For each of the eight inputs:

Input enable	Off
Decimal point	Auto (maximum resolution)
Bar Type	Left
Bar lower limit	0.0
Bar Upper limit	100.0
Gain	1.0
Offset	0.0

To reset the BA648CF-F indicator to the listener factory defaults select 'rESEt' in the listener configuration menu by operating the ▼ or ▲ button. To enter the function press **P** which will reveal '0000' with the left hand digit flashing. To prevent accidental use of this function, '5urE' must be entered to confirm that the instrument is to be reset.

Using the ▼ or ▲ button set the flashing digit to '5' and press the **P** button to move control to the next digit which should be set to 'u'. When the four letters of '5urE' have been entered operating the **E** button will reset the BA648CF-F to the factory defaults. Any existing configuration and addresses will be lost when the indicator is reset.

**6. MAINTENANCE**

**6.1 Fault finding during commissioning**

If a BA648CF-F indicator fails to function during commissioning the following procedure should be followed:

Symptom	Cause	Check:
No Display	Instrument not correctly connected or powered.	9 to 32V between terminals 1 & 2.
When configured as a listener displays 'no ConF'	No inputs are enabled.	Configuration of each input.
When configured as a listener displays 'no dAtA'	No data being received with the current configuration.	Device Address and Variable Identities are correct.  That data has DS-65 format.
Display shows '9.9.9.9.9' with all decimal points flashing; all bargraph segments activated and bargraph scale flashing.	Value over-range	Configuration. and decimal point position.
Display shows '-9.9.9.9.9' with all decimal points flashing; no bargraph segments activated and bargraph scale flashing.	Value under-range	Configuration And decimal point position.
Display alternates between value and the word 'bAd'. Bargraph flashes.	Status of fieldbus variable has a quality of 'BAD' or a fault state is active.	Fieldbus configuration.
Bargraph scale flashes.	Process variable is outside the limits defined for the bargraph.	Bargraph configuration.
All display segments activated.	Display is initialising.	This is normal operation, after a few seconds the model number followed by the firmware version will be displayed prior to entering the display mode.

**6.2 Fault finding after commissioning**

**ENSURE PLANT SAFETY BEFORE STARTING MAINTENANCE**

If a BA648CF-F fails after it has been functioning correctly, the table shown in section 6.1 may help to identify the cause of the failure.

If this procedure does not reveal the cause of the fault, it is recommended that the instrument is replaced.

**6.3 Servicing**

We recommend that faulty BA648CF-F Fieldbus indicators are returned to BEKA associates or to our local agent for repair.

**6.4 Routine maintenance**

The mechanical and electrical condition of the instrument should be regularly checked. Initially annual inspections are recommended, but the inspection frequency should be adjusted to suit the environmental conditions.

**6.5 Guarantee**

Instruments which fail within the guarantee period should be returned to BEKA associates or our local agent. It is helpful if a brief description of the fault symptoms is provided.

**6.6 Customer comments**

BEKA associates is always pleased to receive comments from customers about our products and services. All communications are acknowledged and whenever possible, suggestions are implemented.

## **7. ACCESSORIES**

### **7.1 Scale marking**

BA648CF-F indicators are fitted with a blank escutcheon around the liquid crystal display. If specified when the instrument is ordered, this can be supplied printed with units of measurement and a scale for the horizontal bargraph.

### **7.2 Tag number**

The BA648CF-F can be supplied with a thermally printed tag number on the rear panel adjacent to the terminals.