Supplementary Installation and Operating Instructions
HART Communicator 275
Asset Management Solutions (AMS)
Process Device Manager (PDM)

IFC 110
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1 General Information

The IFC110 is a "four-wire" transmitter with 4...20mA current output and HART® capability. It is available with active current output or active/passive current output.

General characteristics of the IFC110 HART® interface:
- Multidrop Mode is supported
- Burst Mode is not supported

Electrical connection: Refer to sections 2.1, 2.2, 2.6 of the "Installation and Operating Instructions Electromagnetic flowmeters ALTOFLUX IFC 110 F" (KROHNE).

There are two ways of using the HART® communication:

a) As a point-to-point connection between the IFC110 and the HART® master equipment.
b) As a multipoint connection (multidrop) with up to 15 devices (IFC110 or other HART® equipment).

**Multidrop Mode**
If the IFC110 is equipped with a continuously active current output a ‘third wire’ is needed to properly connect it together with two-wire loop powered devices in the same network.

**Multidrop Mode (‘three-wire’)**
(Connecting two-wire and four-wire devices in the same network)

```
250 Ω
```

2 IDs and Revision Numbers

The HART Device Descriptions described in this document have the following IDs and revision numbers:

- Manufacturer ID: 69 (0x45)
- Device Type: 243 (0xF3)
- Device Revision: 2
- DD Revision: 1
- HART Universal Revision: 5
- HC 275 OS Revision: ≥ 4.9
- AMS Version: ≥ 5.0
- PDM Version: ≥ 5.1

For information about Transmitter Revisions and related Device Descriptions refer to the KROHNE HART Device List.
3 Implementation Peculiarities

Variables and functions/processes of the Service Menu are not maintained by the instrument HART® application layer. Still a subset of service parameters is transferred via bus (only reading is possible): it applies to variables that control the limits, availability, etc. of maintenance data.

4 HART Communicator 275 (HC275)

4.1 Installation

The HC275 has to be programmed with the IFC110 HART Device Description. Otherwise the HC275 user will work with the instrument as a generic one thus loosing opportunity for entire instrument control.

4.2 Operating

Refer to the IFC110 Menu Tree HC275 (Attachment A).

The IFC110 operation via HC275 is made quite close to the manual instrument control via keypad.

The online help of each parameter contains its function number as a reference to the device’s local display and the “Installation and Operating Instructions”.

Parameter protection via password (Entry Code) is the same as on local display. Please refer to the online help for valid symbols according to device’s keypad.

While saving configuration to HC275 from connected instrument, some crucial service variables (refer to section 2) are also stored. Hence in the offline mode their values cannot be changed (and will not be sent to device), but are shown to HC275 user and control assignments for maintenance data.

As soon as service functionality is not available via HART transmitter, the difference between “standard configuration” of HC275 and its “full configuration” consists in some read-only parameters (sensor limits, device modules’ IDs, etc.) that are either transferred to AMS (“full configuration”) or are shown on AMS tabs as empty fields (“standard configuration”).

5 Asset Management Solutions (AMS)

5.1 Installation

If the IFC110 Device Description is not already installed on the AMS System a so called Installation Kit IFC110 HART AMS is needed (available on floppy disk from KROHNE or as download from KROHNE Internet page).

For installing the DD with the Installation Kit refer to the “AMS User’s Guide” section 3: “Managing HART Devices”/ “Adding new Device Types to AMS”/ “Install Device Types Manually”.

5.2 Operating

Refer to the IFC110 Menu Tree AMS (Attachment B).

Due to AMS requirements and conventions the IFC110 operation differs a little from operation with HC275 and via local keypad.

The online help of each parameter contains its function number as a reference to the device’s local display and the “Installation and Operating Instructions”.

Parameter protection via password (Entry Code) is the same as on local display. Please refer to the online help for valid symbols according to device’s keypad.
6 **Process Device Manager (PDM)**

6.1 **Installation**
If the IFC110 Device Description is not already installed on the PDM System a so called *Device Install* is needed (available on floppy disk from KROHNE or as download from KROHNE Internet page).
For installing the DD with the Device Install refer to the “PDM Manual” section 7.2: "Utilities" / “Device Install”. Please read also the “readme.txt”, which is also contained in the Device Install.

6.2 **Operating**
Refer to the IFC110 Menu Tree PDM (Attachment C).
Due to PDM requirements and conventions the IFC110 operation differs a little from operation with HC275 and via local keypad.
The online help of each parameter contains its function number as a reference to the device’s local display and the “Installation and Operating Instructions”.
IFC110 Menu Tree AMS

Process input
- Flow
- Time Constant

Device
- Tag
- Descriptor

HART
- Polling Address
- Device ID

Output
- Flow, I
- Percent of Range
- Flow, P
- Flow, P2

Diagnostics and Test
Calibrate

Reset

Protection

Assign / Replace
Delete
Rename

Audit Trail
Drawings / Notes...

Help...

Clear Offline Configuration
Compare Configurations

Configuration Properties

Process Variables
Status
Scan Device

Diagnostics and Test
Calibrate

Overview
- Primary variable out of limits
- Non-primary variable out of limits
- Primary variable analog output saturated
- Primary variable analog output fixed
- Cold start
- Configuration changed
- Field device malfunction

Errors
- Fatal
  - Fatal Error
  - ADC Hardware
  - ADC Parameters
  - ADC Gain
  - FC-Hardware
- Other
  - Empty Pipe parameter error

Warnings
- ADC overranged
- Totalizer overflow
- Empty pipe
- I Short
- I Open
- Line interrupt
- Device is controlled via its keypad

- Current output I overranged
- Pulse Output P overranged
- Pulse Output P2 overranged
- Current Output I fixed
- Pulse Output P fixed
- Pulse Output P2 fixed

Hardware Info
ADC Module
- ID-No
- Status

IO Module
- ID-No
- Status

Display Module
- ID-No
- Status

RS Module
- ID-No
- Status

Test Range Q
Hardware Test

Zero Trim
Apply Full Scale
Calibration Management

Master Reset
Error reset
Reset Totalizers
Stop/resume Totalizers

Designations:
**Optional, dependent on device implementation / configuration
*Rd Read-only
*Loo Local AMS, affects only AMS views
IFC110 Menu Tree AMS

**Process Variables**
- Status
- Scan Device
- Diagnostics and Test
- Calibrate
- Reset
- Protection
- Assign / Replace
- Delete
- Rename
- Audit Trail
- Drawings / Notes
- Help
- Clear Offline Configuration
- Compare Configurations
- Configuration Properties

**Basic Setup**
- HART
  - tag
- Sensor
  - Upper Sensor Limit 
  - Minimum Span
- Process Input
  - Full Scale
  - Time Constant
- Analog Output
  - Damping applied to
  - Terminal A1

**Output**
- Damping applied to
  - Terminal A1
  - Terminal A2
- Current Output 1
  - Function 1
  - Reverse Range
  - Reverse Value
  - 1 0%
  - 1 100%
  - 1 Max
  - 1 Error
- Pulse output P
  - Function P
  - Pulse Type P
  - Pulse Control P
  - Pulse Width P
  - Unit Pulse P
  - Pulse Value P
- Pulse output P2
  - Function P2
  - Pulse Type P2
  - Pulse Control P2
  - Pulse Width P2
  - Unit Pulse P2
  - Pulse Value P2

**Sensor**
- Primary Head
  - Diameter
  - GK Value
  - Flow Direction
  - Field Frequency
  - Line Frequency
  - Field current
- Sensor limits
  - Upper Sensor Limit
  - Minimum Span
  - Empty pipe detection
  - Empty Pipe

**Process Input**
- Unit Flow
- Full Scale
- Time Constant
- Low Flow Cutoff
- L.F.Cutoff
- Cutoff On
- Cutoff Off
- Application
  - Application Flow
  - ADC Gain
  - Special Filter
  - Limit Value
  - Limit Counter

**Status Output/Control Input**
- Functions
  - Status A1
  - Status A2
  - Status D1
  - Status D2
  - Control C1
  - Control C2
- Range Settings
  - Trip.Point 1
    - Full Scale
    - XXX
    - YYY
  - Trip.Point 2
    - Full Scale
    - XXX
    - YYY
  - Auto/External Range

**Display**

**Device**

**Communication**

**Designations:**
- **Opt** Optional, dependent on device implementation / configuration
- **Rd** Read-only
- **Loc** Local AMS, affects only AMS views

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IFC110 Menu Tree AMS

- **Process Variables**
  - Status
  - Scan Device

- **Diagnostics and Test**
  - Calibrate

- **Reset**

- **Protection**
  - Assign / Replace
  - Delete
  - Rename

- **Audit Trail**
  - Drawings / Notes...

- **Help**

- **Clear Offline Configuration**
  - Compare Configurations

- **Configuration Properties**

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**Designations:**
- Opt: Optional, dependent on device implementation / configuration
- Rd: Read-only
- Loc: Local AMS, affects only AMS views

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**Local Display**
- Language
- Text Volume
- Factor Volume
- Text Time
- Factor Time
- Display Messages

**Device**
- Identification
  - Manufacturer Opt
  - Model Opt
  - Device Id Opt
  - Universal rev. Opt
  - Field Device rev. Opt
  - Software rev. Opt
  - Hardware rev. Opt
  - Descriptor
  - Message
  - Date
  - Final Assembly Number
  - Sensor Serial Number

- Device Modules
  - ADC ID Number Opt
  - I/O ID Number Opt
  - Display ID Number Opt
  - RS ID Number Opt

- Parameter protection
  - Write protect Opt

- Communication
  - COM 1 / HART
    - Tag
    - Polling Address
    - Device Id Opt
    - Number request preams Opt
    - Number response preams

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Designations:
- Optional, dependent on device implementation / configuration
- Read-only
- Local PDM, affects only PDM views
### IFC110 Menu Tree PDM

#### Menu Bar

<table>
<thead>
<tr>
<th>File</th>
<th>Device</th>
<th>View</th>
<th>Options</th>
<th>Help</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Display

- Yt diagram

#### Process Variables

- Flow /Ranges
- Flow /Sensor Limits
- Time Constant
- + Totalizer
- - Totalizer
- Totalizer Sum
- Device Status

#### Outputs / Inputs

- Flow, I
- % Range
- Flow, P Opt
- Flow, P2 Opt
- Status A1 Opt
- Status A2
- Status D1
- Status D2
- Control C1
- Control C2

#### Device

- Tag
- Manufacturer \( ^* \)
- Device Type \( ^* \)
- HART Device ID \( ^* \)
- Universal Revision \( ^* \)
- Device Revision \( ^* \)
- Software Revision \( ^* \)
- Hardware Revision \( ^* \)
- Final Assembly No.
- Sensor Serial No.

#### Hardware Info

- ADC ID-Number \( ^* \)
- ADC Status
- IO ID-Number \( ^* \)
- IO Status
- Display ID-Number \( ^* \)
- Display Status
- RS ID-Number \( ^* \)
- RS Status

#### Device Diagnosis

**Overview**
- Primary variable outside the operating limits
- Non-primary variable outside the operating limits
- Analog output outside the operating range limits
- Analog output in fixed mode
- Cold start occurred
- Configuration changed
- Field device malfunction

**Errors**
- Fatal Error
- ADC Hardware
- ADC Parameters
- ADC Gain
- FC-Hardware

**Warnings**
- Totalizer overflow
- Line interrupt
- Selftest over
- Device is controlled via its keypad
- Empty pipe
- ADC overranged
- I short
- I open

**Designations:**

- \( ^* \) Optional, dependent on device implementation / configuration
- \( ^* \) Read-only
- \( ^* \) Local PDM, affects only PDM views

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IFC110 Menu Tree PDM

Parameter Table

Identification
Operation Unit
Device

Input
Measuring Limits
Flow
Process Value Scale
Flow

Output
Current Output 1
Hardware
Pulse Output P
Pulse Output P2
Binary Inputs/Outputs
Totalizer

Mechanical Construction
Sensor

Human Interface
Local Display

Identification

Operation Unit
• Tag
• Descriptor
• Message

Device
• Manufacturer
• Device Type
• HART Device ID
• Universal Revision
• Device Revision
• Software Revision
• Hardware Revision
• ADC Module ID
• IO Module ID
• Display Module ID
• RS Module ID
• Write Protection
• Final Assembly Number
• Sensor Serial Number
• Date

Input
• Flow Direction
• Low Flow Cutoff
• Cutoff On
• Cutoff Off
• Application Flow
• ADC Gain
• Special Filter
• Limit Value
• Limit Counter
• Field Frequency
• Line Frequency
• Field Current
• Empty Pipe

Measuring Limits Flow
• Upper Sensor Limit
• Minimum Span

Process Value Scale Flow
• Unit Flow
• Full Scale

Designations:

Optional, dependent on device implementation / configuration
Read-only
Local PDM, affects only PDM views
IFC110 Menu Tree PDM

Parameter Table

Identification
- Operation Unit
- Device

Input
- Measuring Limits
- Flow
- Process Value Scale
- Flow

Output
- Hardware
- Current Output I
- Pulse Output P
- Pulse Output P2
- Binary Inputs/Outputs
- Totalizer

Mechanical Construction
- Sensor

Human Interface
- Local Display

Designations:
- *Optional*, dependent on device implementation / configuration
- ♦ Read-only
- ≈ Local PDM, affects only PDM views

Output
- Damping applied to
- Time Constant

Hardware
- Terminal A1

Current Output I
- Function I
- Reverse Range
  - Reverse Value ♦
  - I 0%
  - I 100%
  - I Max
  - I Error

Pulse Output P
- Function P
- Pulse Type
- Pulse Control
  - Pulse Width ♦
- Unit Pulse
- Pulse Value

Pulse Output P2
- Function P2 ♦
- Pulse Type ♦
- Pulse Control ♦
  - Pulse Width ♦
- Unit Pulse ♦
- Pulse Value ♦

Binary Inputs/Outputs
- Status A1 ♦
- Status A2
- Status D1
- Status D2
- Control C1
- Control C2
- Auto/External Range ♦

Trip Point 1 ♦
- Characteristic ♦
- XXX ♦
- YYY ♦

Trip Point 2 ♦
- Characteristic ♦
- XXX ♦
- YYY ♦

Totalizer
- Unit Totalizer

Mechanical Construction Sensor
- Diameter
- GK Value

Human Interface
- Display Format Flow ♦
- Unit Totalizer
- Display Format Totalizer ♦
- Unit Pulse P
- Display Format Pulse P ♦
- Unit Pulse P2
- Display Format Pulse P2 ♦

Local Display
- Language
- Text Volume
- Text Time
- Factor Volume
- Factor Time
- Display Messages

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