

Supplementary Installation and Operating Instructions



Optiflux IFC300 Converter with HART Interface (Dev Rev 2, DD Rev 1)

- HART/Field Communicator 375
- Asset Management Solutions (AMS)
- Process Device Manager (PDM)
- Field Device Tool/Device Type Manager (FDT/DTM)



| | | |
|----------|--|----------|
| 1 | General Information | 3 |
| 2 | IDs and Revision numbers | 5 |
| 3 | Inputs/Outputs and HART Dynamic/Transmitter Variables | 6 |
| 4 | Basic Configuration Parameters | 7 |
| 5 | Field Communicator 375 (FC375) | 7 |
| 5.1 | Installation | 7 |
| 5.2 | Operating | 7 |
| 6 | Asset Management Solutions (AMS) | 7 |
| 6.1 | Installation | 7 |
| 6.2 | Operating | 7 |
| 7 | Process Device Manager (PDM) | 8 |
| 7.1 | Installation | 8 |
| 7.2 | Operating | 8 |
| 8 | Field Device Tool Device Type Manager (FDT DTM) | 8 |
| 8.1 | Installation | 8 |
| 8.2 | Operating | 8 |
| 9 | Attachment: Menu Trees for FC375, AMS and PDM | 9 |

1 General Information

The IFC 300 is a “four-wire” transmitter with 4...20mA current output and HART® capability. Dependent on jumper setting and/or wiring the current output can operate as active or passive output.

General characteristics of the IFC 300 HART® interface:

- Multidrop Mode is supported
- Burst Mode is not supported

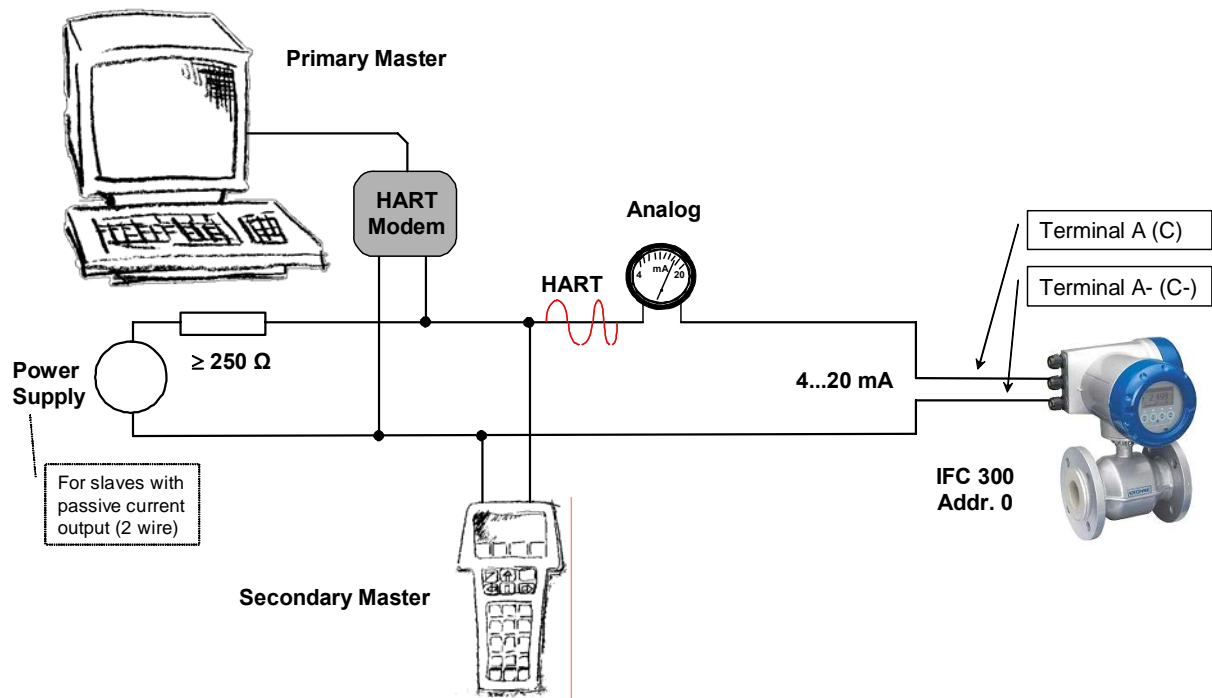
Electrical connection: Refer to section “Electrical connection: outputs and inputs” of the following manual:

- “Handbook IFC 300 signal converter” (KROHNE)

There are two ways of using the HART® communication:

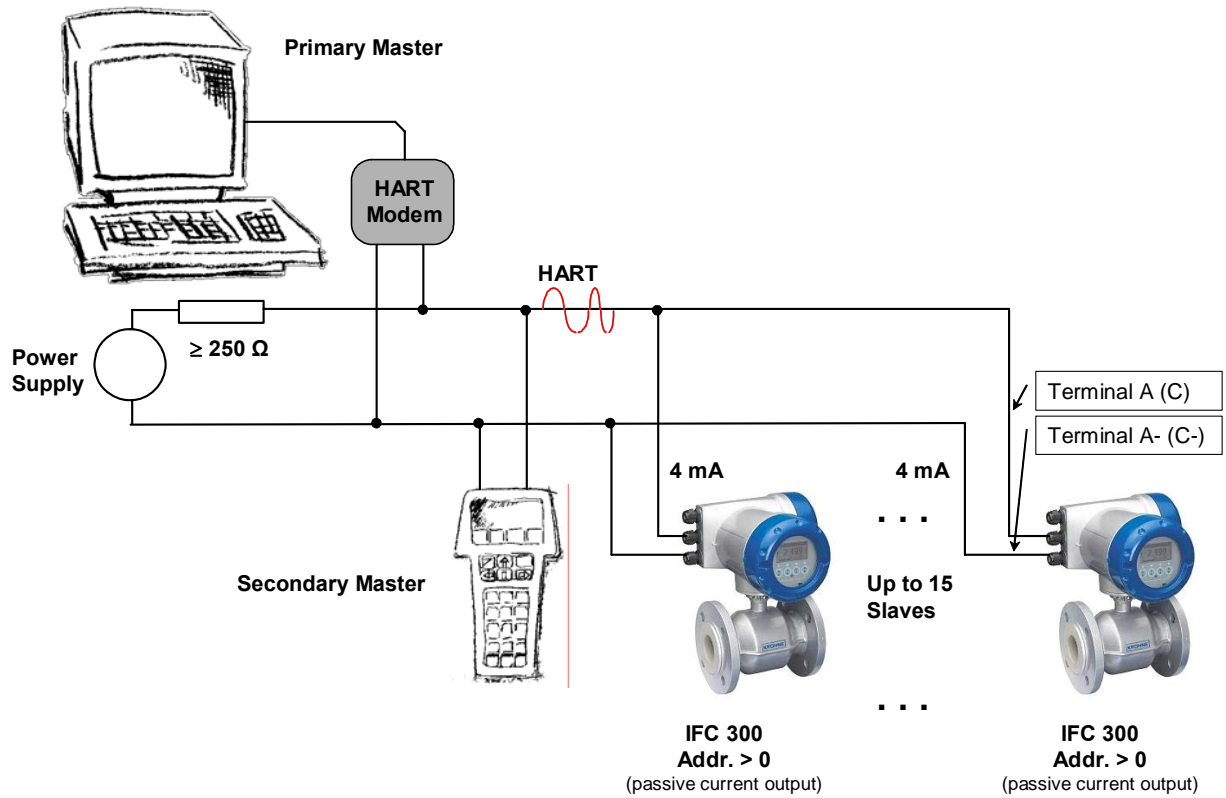
a) As a point-to-point connection between the IFC 300 and the HART master equipment. The instrument's current output may be active or passive.

Point-to-Point Analog/Digital Mode



b) As a multipoint connection (multidrop) with up to 15 devices (IFC 300 or other HART® equipment) in parallel. The instrument's current outputs must be passive.

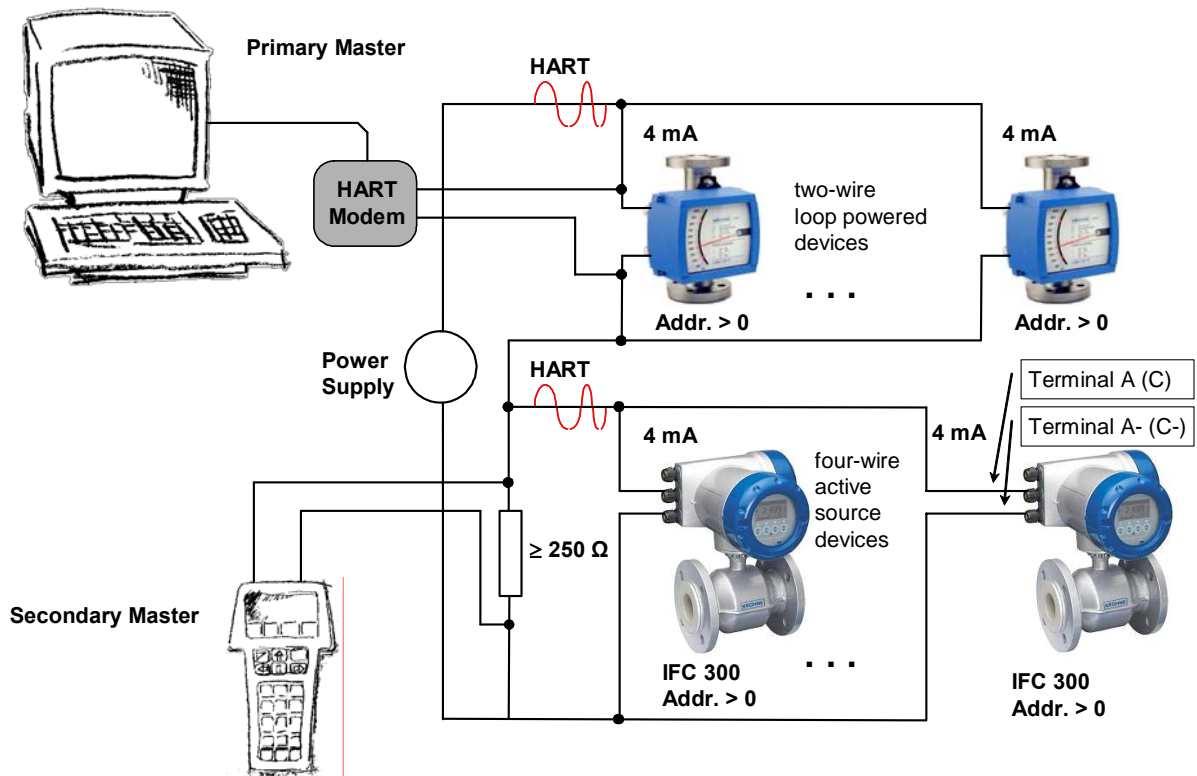
Multidrop Mode



In case the IFC 300's current output shall work continuously active 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)



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: | 227 (0xE3) |
| Device Revision: | 2 |
| DD Revision: | 1 |
| HART Universal Revision: | 5 |
| FC 375 System SW Rev.: | ≥ 1.8 |
| AMS Version: | ≥ 6.0 |
| PDM Version: | ≥ 6.0 |

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

3 Inputs/Outputs and HART Dynamic/Transmitter Variables

The IFC 300 is available with a choice of output/input assemblies (see details in the section "I/O assemblies for the outputs and inputs" of the "Handbook IFC 300 signal converter" (KROHNE)):

The assignment of the I/O terminals (A, B, C and D) to the HART Dynamic Variables (PV, SV, TV and FV) depends on the device's I/O option:

| | HART Dynamic Variables: | | | |
|--------------------------------------|-------------------------|----|----|----|
| | PV | SV | TV | FV |
| Basic I/O terminals: | A | D | - | - |
| Modular I/O and EEx-i I/O terminals: | C | D | A | B |

The IFC 300 transmitter handles up to 10 measurement-related HART Transmitter Variables but the sub-set of available variables depends on the device's I/O option and its configuration:

| HART Transmitter Variable | Code ¹ | Type | Notes |
|---------------------------|-------------------|-----------|--|
| Flow Speed | 20 | Linear | |
| Volume Flow | 21 | Linear | |
| Mass Flow | 22 | Linear | |
| Conductivity | 24 | Linear | |
| Coil Temperature | 23 | Linear | |
| Counter 1 (C) | 6 | Totaliser | valid for Basic IO option only |
| Counter 1 (B) | 13 | Totaliser | valid for Modular I/O and EEx-i I/O options only |
| Counter 2 (D) | 14 | Totaliser | |
| Counter 3 (A) | 12 | Totaliser | valid for Modular I/O and EEx-i I/O options only |
| Diagnosis Value | 25 | Linear | function and validity depend on 'diagnosis value' setting (Fct. C1.3.17) |

¹ HART Transmitter Variable Code

To Dynamic Variables which are tied to linear analogue outputs (i.e. current outputs and frequency outputs) the HART Transmitter Variables are assigned by selecting the 'measurement' (Fct. C2.x.5) for these outputs. (E.g. when selecting the 'measurement' volume flow for current output A of a device with Basic IO the HART Transmitter Variable Volume Flow is assigned to the HART Dynamic Variable PV). This implies that only Transmitter Variables of linear type can be assigned to Dynamic Variables tied to current or frequency outputs. (A totaliser variable e.g. can't be assigned to PV, the HART current output)

For Dynamic Variables not tied to linear analogue outputs there is no such correlation: Both linear and totaliser type Transmitter Variables can be assigned (Fct. C4). (Therefore a totaliser variable e.g. can be assigned to SV, TV and FV unless the respective output is a current or frequency output.)

4 Basic Configuration Parameters

There are some parameters (namely measurement counter 1..3 and diagnosis value selection) which, after they have been changed, require a warm start of the device e.g. for updating dependent units parameters, before any other parameters may be written. Dependent on the characteristics and capabilities of the HART host system (e.g. online-/offline-orientation) these parameters are treated differently (see details below).

5 Field Communicator 375 (FC375)

5.1 Installation

The IFC 300 HART Device Description has to be installed on the FC375 respectively. Otherwise the user will work with the instrument as a generic one thus losing opportunity for entire instrument control. For installing DDs on the FC375 the 'Easy Upgrade Programming Utility' is needed and the FC375 must have a System Card with 'Easy Upgrade' option (see details in the '375 Field Communicator User's Manual').

5.2 Operating

Refer to the IFC 300 Menu Tree FC375 (Attachment A).

The IFC 300 operation via FC375 is made quite close to the manual instrument control via keypad with the restriction that parameters of the device's "service" menu are not supported and simulation is possible only for current outputs. The online help of each parameter contains its function number as a reference to the device's local display and the "Handbook".

Parameter protection for custody transfer is the same as on the device's local display. Other specific protection mechanisms like "password quick setup" and "password setup" are not supported via HART. The FC375 always creates a "full" configuration for interaction with AMS. Still the FC375 considers only a partial parameter set (like the "standard configuration" in the HART Communicator HC275) when sending it to a device.

Basic Configuration Parameters:

In online mode the counter measurement and diagnosis value settings can be changed with the corresponding methods located in the menu tree below the related parameter. When editing an offline configuration these parameters are read only, however they are written to the device when sending an offline configuration

6 Asset Management Solutions (AMS)

6.1 Installation

If the IFC 300 Device Description is not already installed on the AMS System a so called *Installation Kit IFC 300 HART AMS* is needed (available as download from KROHNE 'Download Center' on the internet or on floppy disk / CD-ROM from KROHNE).

For installing the DD with the Installation Kit refer to the "*AMS Intelligent Device Manager Books Online*" section "*Basic AMS Functionality / Device Configurations / Installing Device Types / Procedures / Install device types from media*". Please read also the "readme.txt", which is also contained in the Installation Kit.

6.2 Operating

Refer to the IFC 300 Menu Tree AMS (Attachment B).

Due to AMS requirements and conventions the IFC 300 operation differs to some extent from operation with FC375 and via local keypad. Furthermore parameters of the device's "service" menu are not supported and simulation is possible only for current outputs. The online help of each parameter contains its function number as a reference to the device's local display and the "Handbook".

Parameter protection for custody transfer is the same as on the device's local display. Other specific protection mechanisms like "password quick setup" and "password setup" are not supported via HART.

Basic Configuration Parameters:

In online mode the counter measurement and diagnosis value settings can be changed with the corresponding methods located in the "Basic Configuration" menu. When editing an offline configuration these parameters are read only.

7 Process Device Manager (PDM)

7.1 Installation

If the IFC 300 Device Description is not already installed on the PDM System a so called *Device Install IFC 300 HART PDM* is needed (available as download from KROHNE 'Download Center' on the internet or on floppy disk / CD-ROM from KROHNE).

For installing the DD on PDM V 5.2 refer to the "*PDM Manual*" section 11.2: "*Device Install / Integrating Devices in SIMATIC PDM with 'Device Install'*".

For installing the DD on PDM V 6.0 refer to the "*PDM Manual*" section 13: "*Integrating Devices*".

Please read also the "readme.txt", which is also contained in the Device Install.

7.2 Operating

Refer to the IFC 300 Menu Tree PDM (Attachment C).

Due to PDM requirements and conventions the IFC 300 operation differs to some extent from operation with FC375 and via local keypad. Furthermore parameters of the device's "service" menu are not supported and simulation is possible only for current outputs. The online help of each parameter contains its function number as a reference to the device's local display and the "Handbook".

Parameter protection for custody transfer is the same as on the device's local display. Other specific protection mechanisms like "password quick setup" and "password setup" are not supported via HART.

Basic Configuration Parameters:

In the PDM offline Parameter Table the counter measurement and diagnosis value settings can be changed directly and dependent units parameters are updated automatically. However in Online Dialogs of the PDM Parameter Table an automatic update isn't possible.

8 Field Device Tool Device Type Manager (FDT DTM)

8.1 Installation

If the IFC 300 Device Type Manager is not already installed on the Field Device Tool container a *setup* is needed (available as download from KROHNE 'Download Centre' on the internet or on CD-ROM from KROHNE).

For installing the DTM with the setup refer to the setup's accompanying documentation.

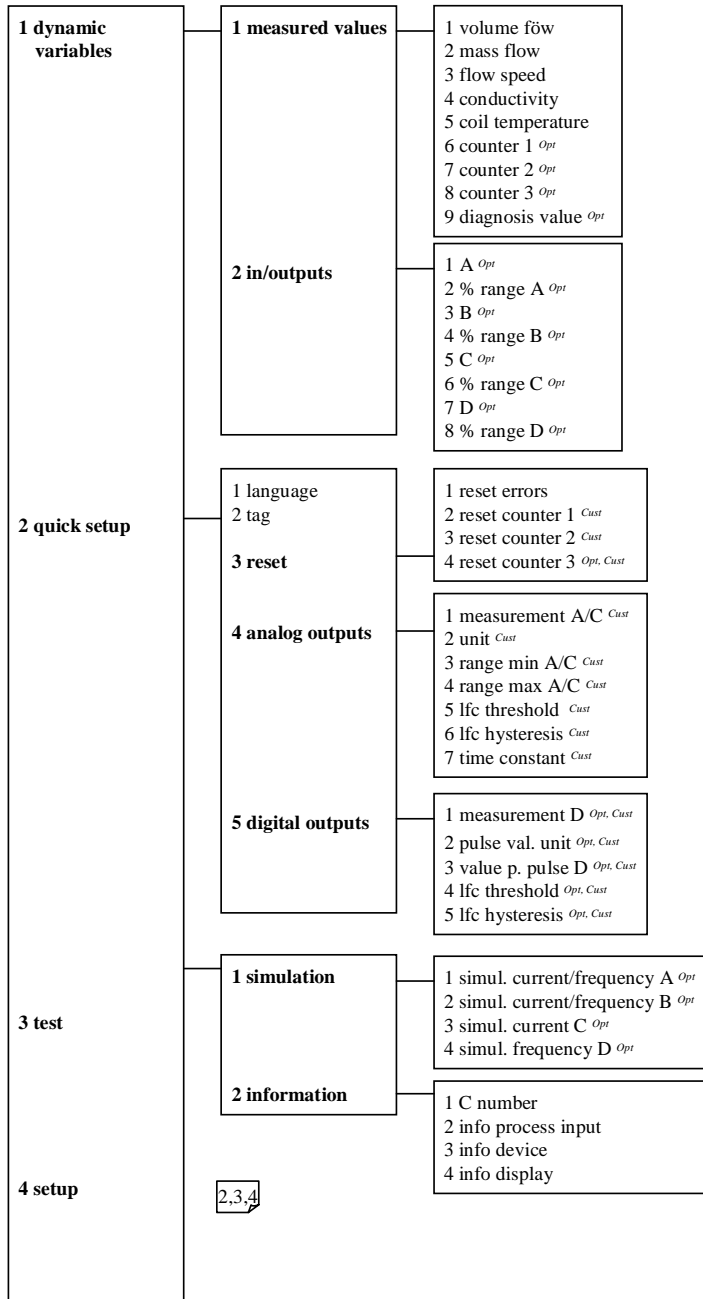
8.2 Operating

The IFC 300 operation via DTM is made quite close to the manual instrument control via keypad. Refer to the device's local display and the "Handbook".

9 Attachment: Menu Trees for FC375, AMS and PDM

Attachment A

IFC 300 HART Menu Tree FC375



Designations:

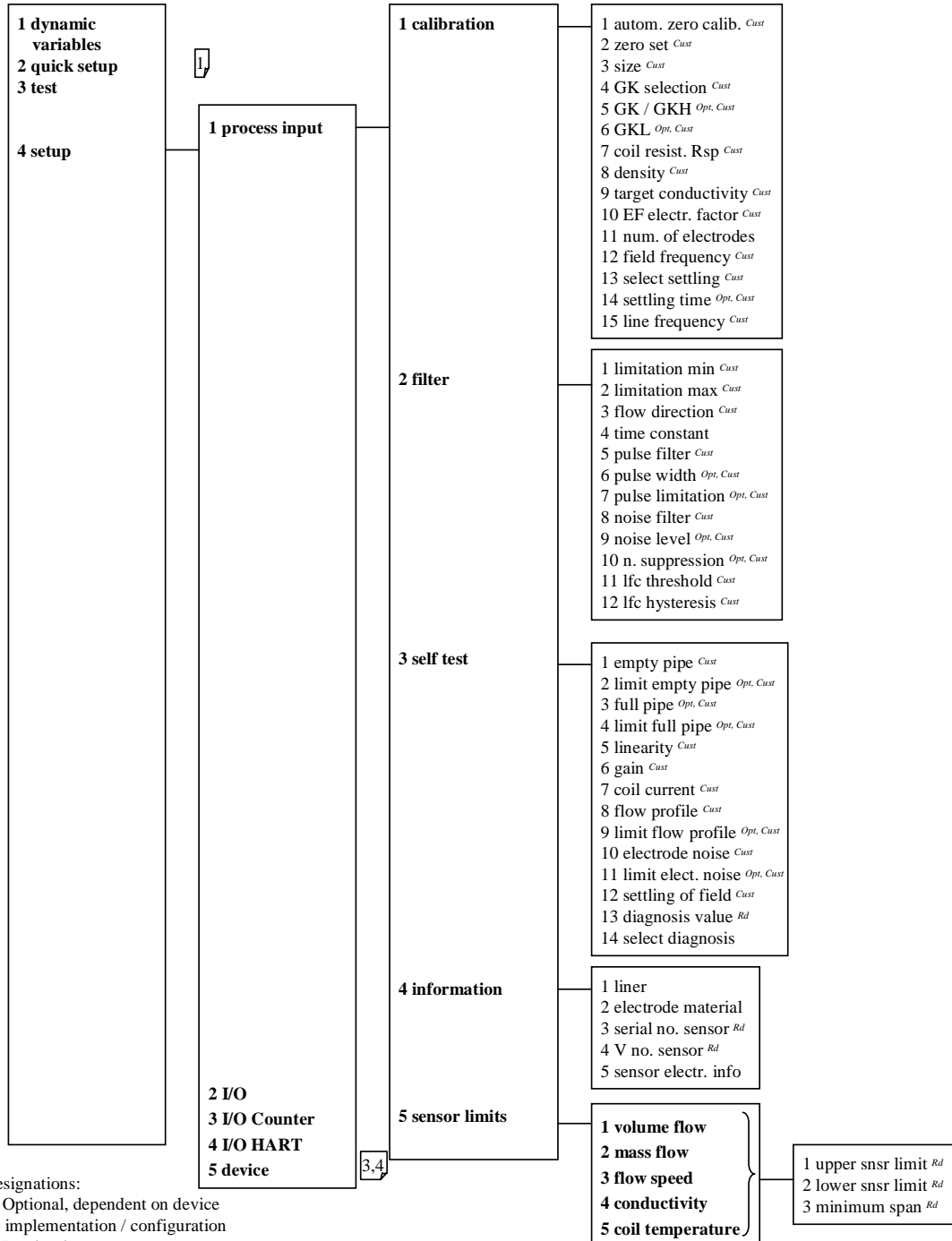
Opt Optional, dependent on device implementation / configuration

Red Read-only

Cust Custody Lock protected

Loc Local FC375, affects only FC375 views

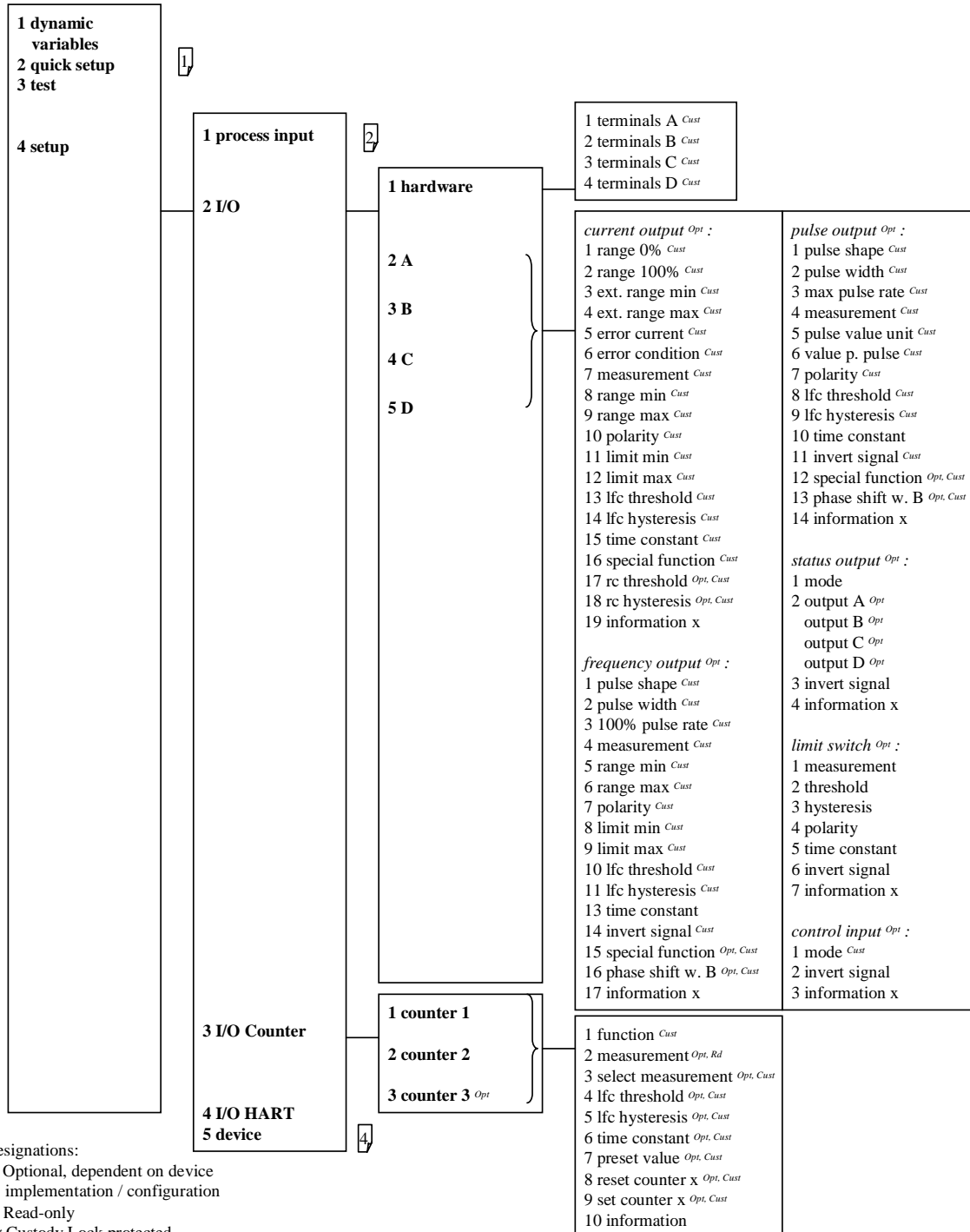
IFC 300 HART Menu Tree FC375



Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local FC375, affects only FC375 views

KROHNE IFC 300 HA 45e30201 (2/4)
04/06

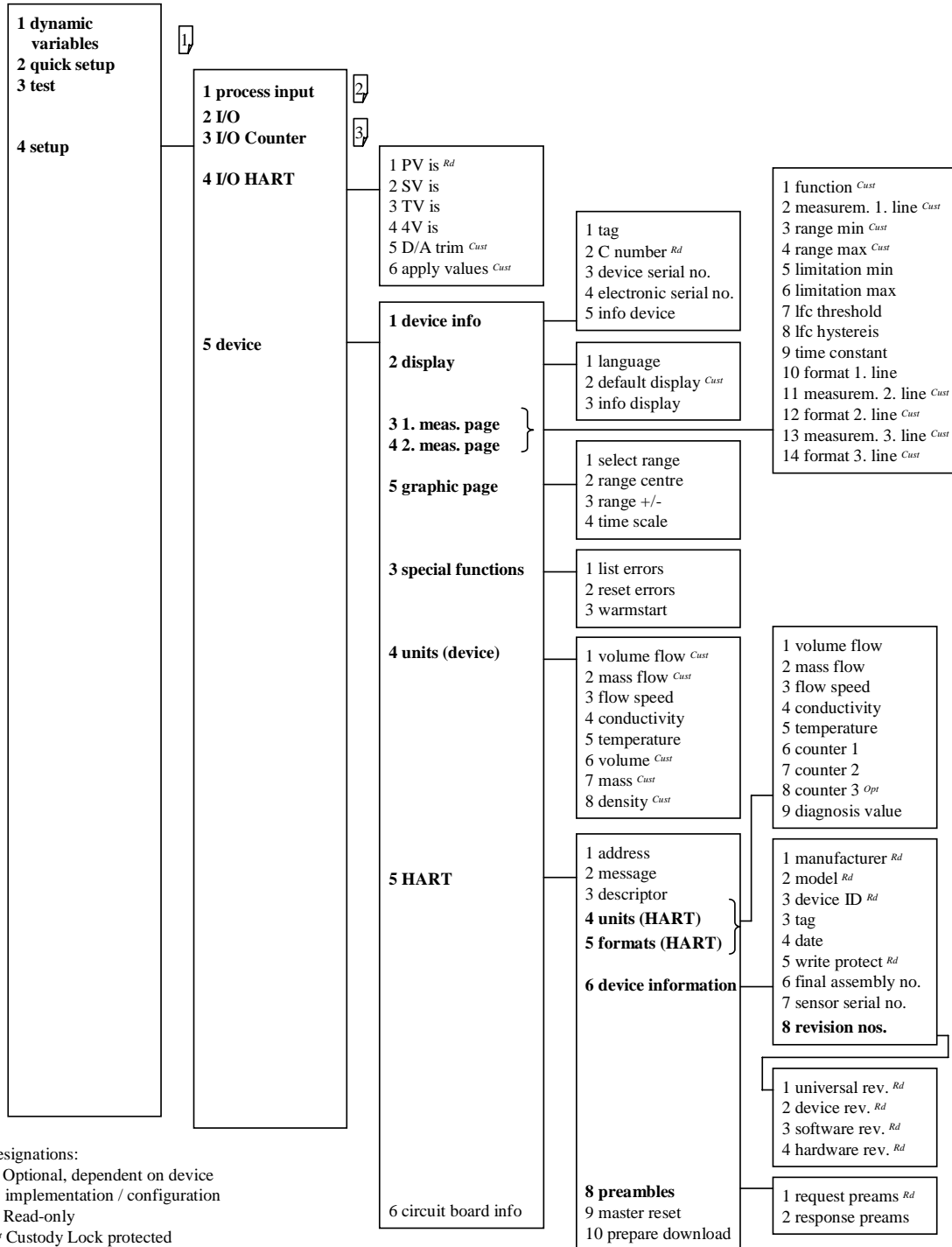
IFC 300 HART Menu Tree FC375



Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local FC375, affects only FC375 views

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04/06

IFC 300 HART Menu Tree FC375

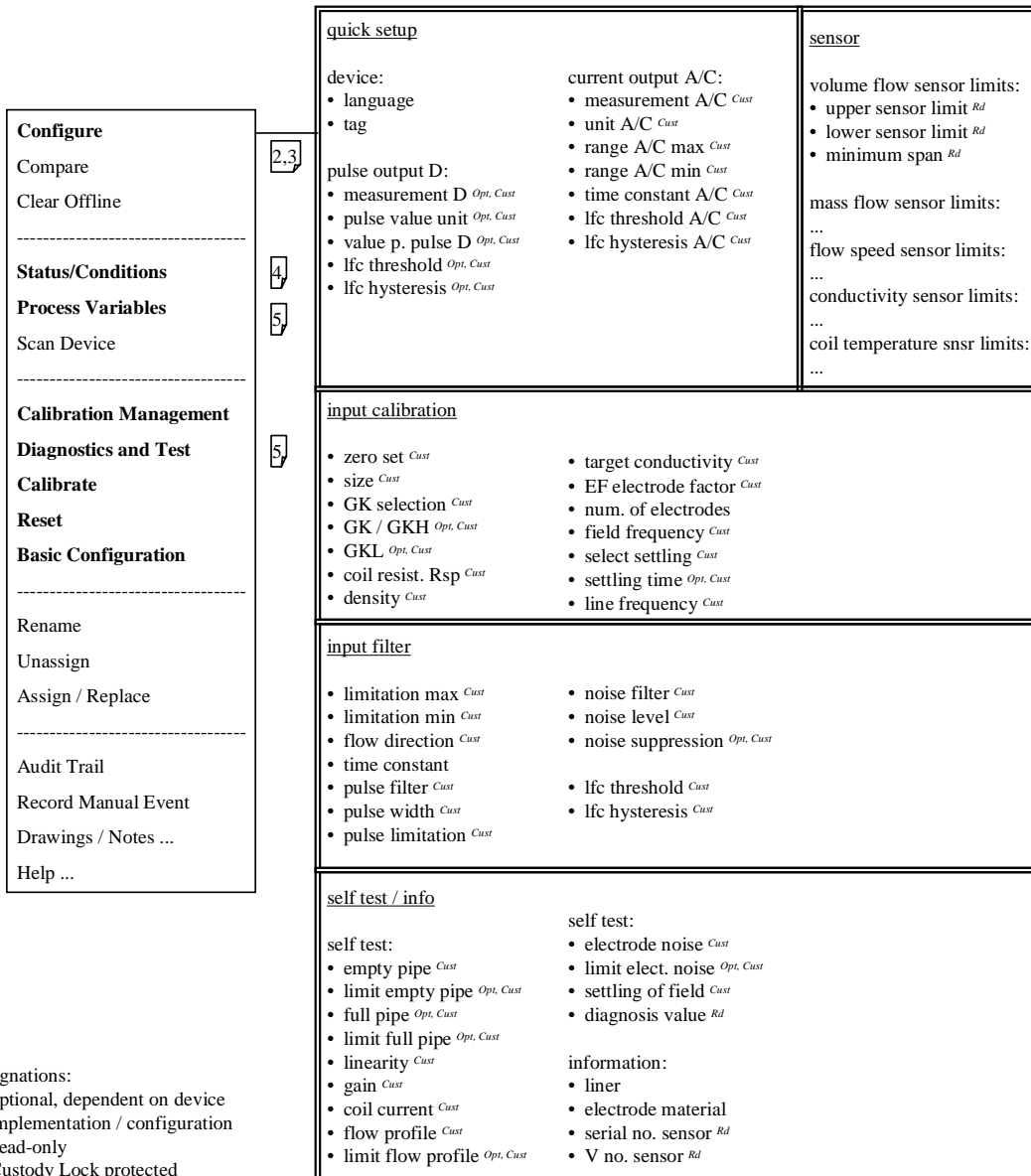


Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local FC375, affects only FC375 views

KROHNE IFC 300 HA 45e30201 (4/4)
04/06

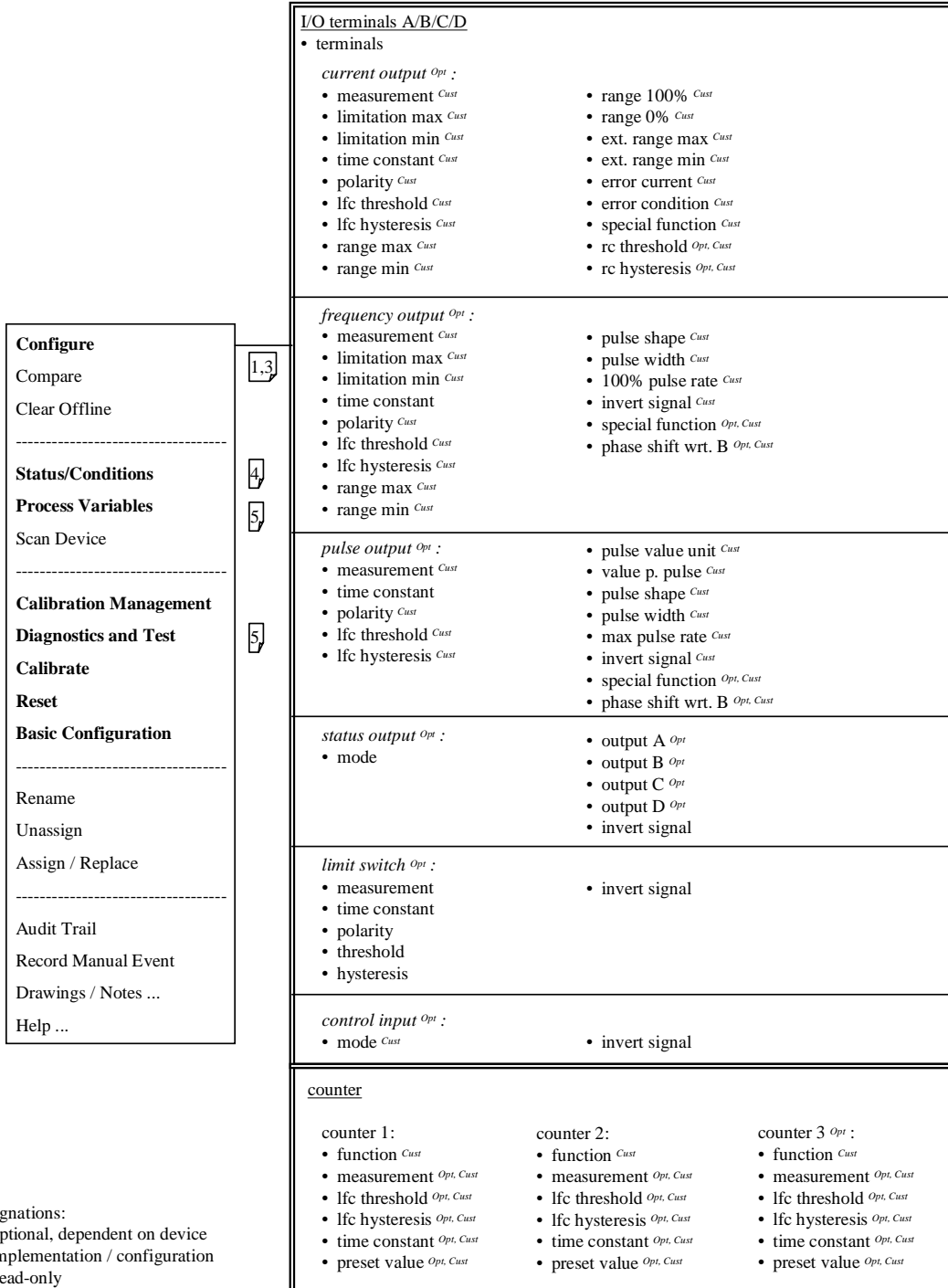
Attachment B

IFC 300 HART Menu Tree AMS



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

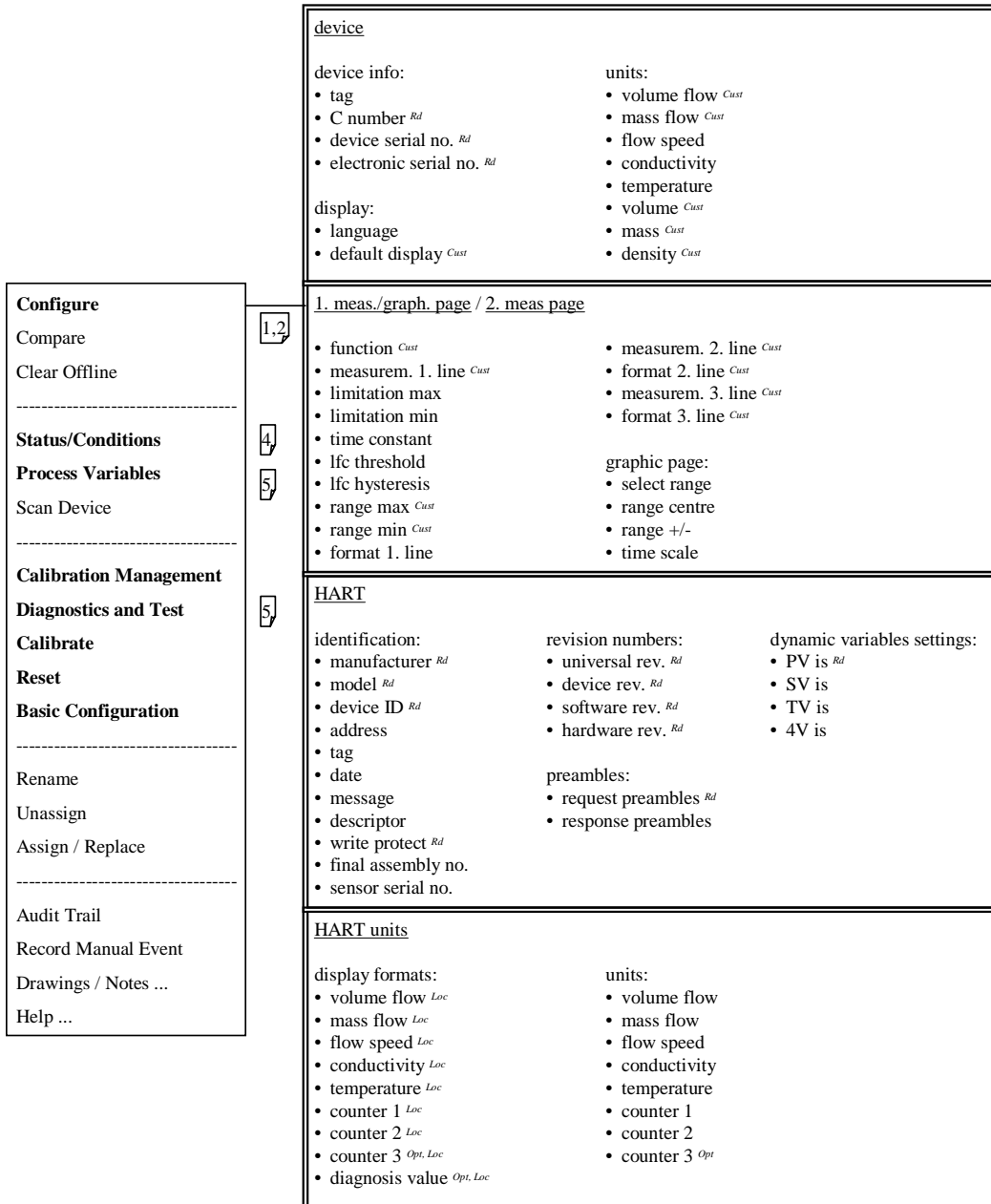
IFC 300 HART Menu Tree AMS



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

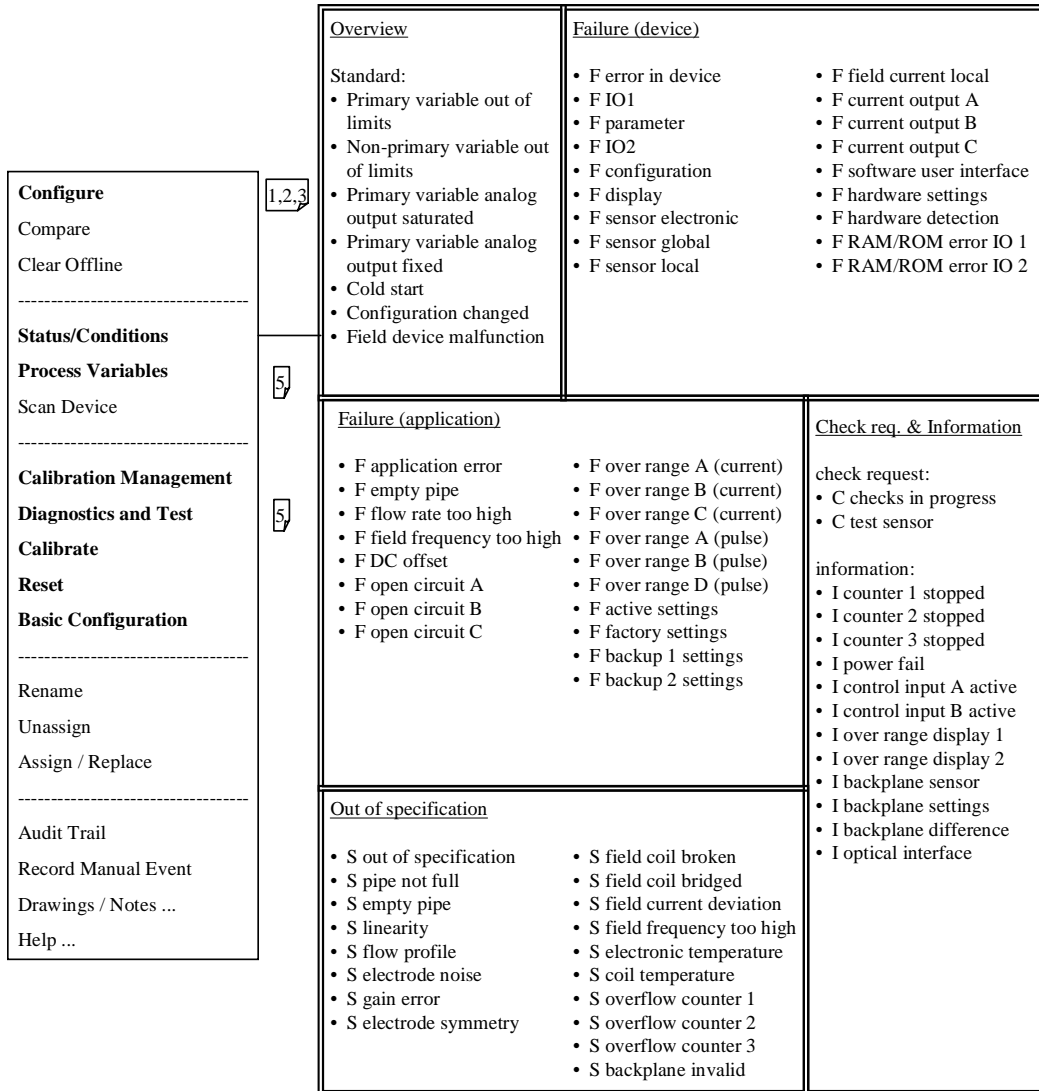
KROHNE IFC 300 HA 45e30201 (2/5)
 04/06

IFC 300 HART Menu Tree AMS



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

IFC 300 HART Menu Tree AMS



Designations:

Opt Optional, dependent on device implementation / configuration

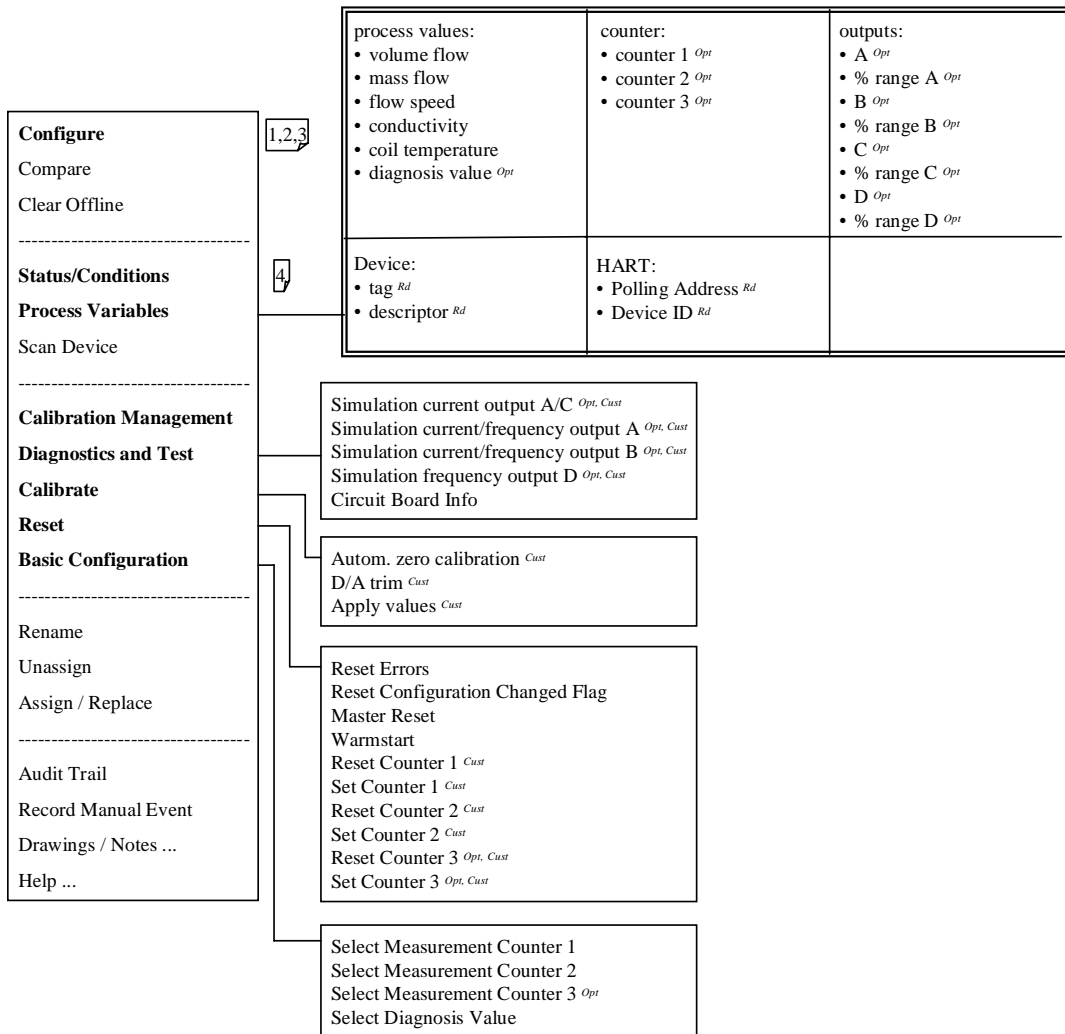
Rd Read-only

Cust Custody Lock protected

Loc Local AMS, affects only AMS views

KROHNE IFC 300 HA 45e30201 (4/5)
04/06

IFC 300 HART Menu Tree AMS



Designations:

Opt Optional, dependent on device implementation / configuration

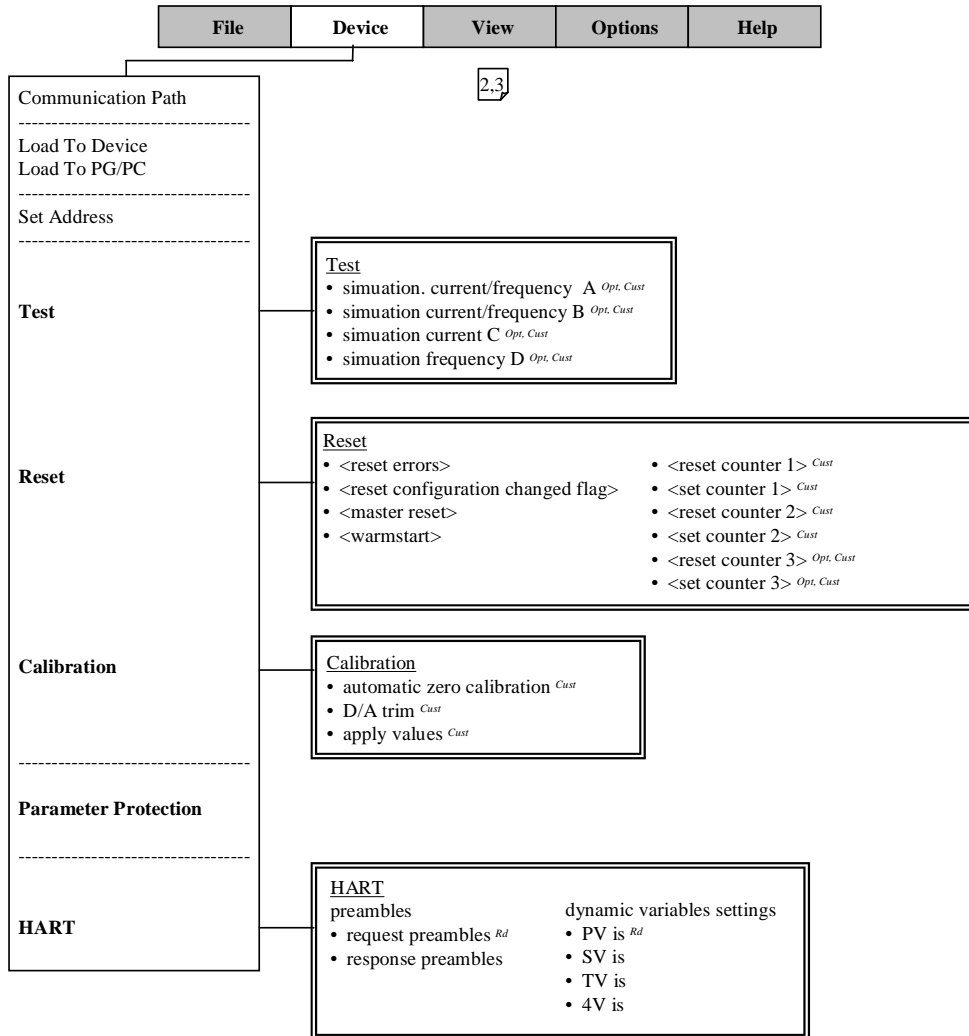
Rd Read-only

Cust Custody Lock protected

Loc Local AMS, affects only AMS views

Attachment C

**IFC 300 HART Menu Tree PDM
Menu Bar**



Designations:

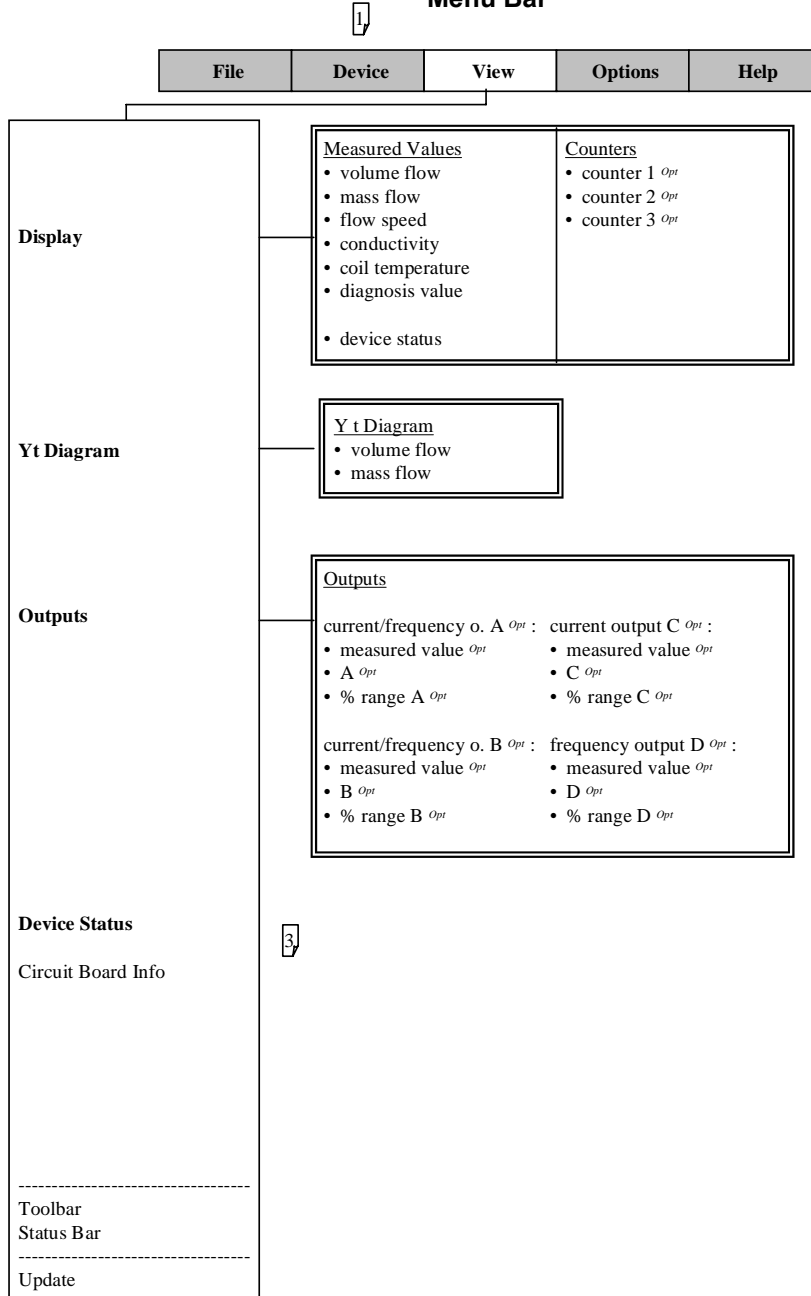
Opt Optional, dependent on device implementation / configuration

Rd Read-only

Cust Custody Lock protected

Loc Local PDM, affects only PDM views

IFC 300 HART Menu Tree PDM
Menu Bar



Designations:

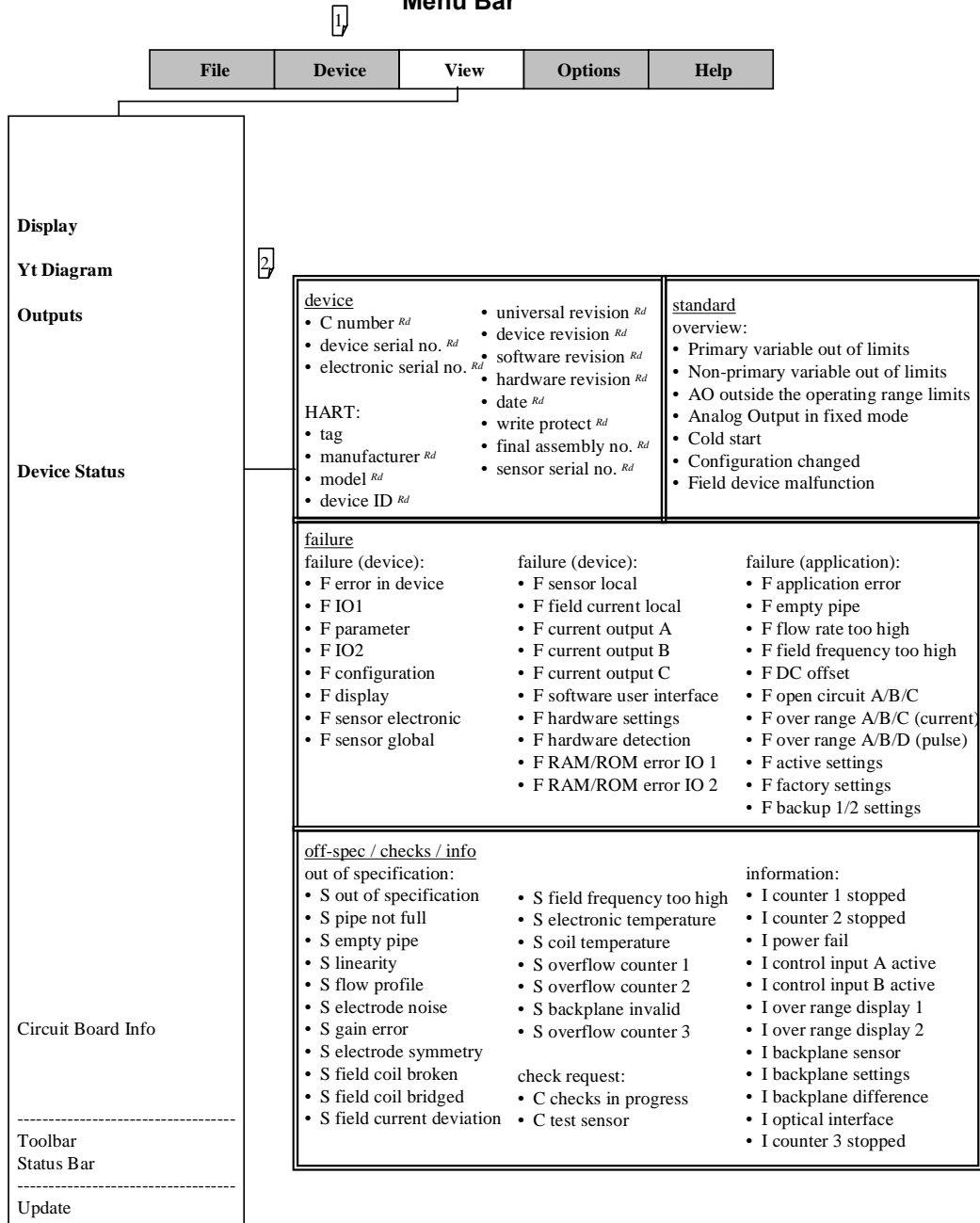
Opt Optional, dependent on device implementation / configuration

Rd Read-only

Cust Custody Lock protected

Loc Local PDM, affects only PDM views

IFC 300 HART Menu Tree PDM
Menu Bar



Designations:

Opt Optional, dependent on device implementation / configuration

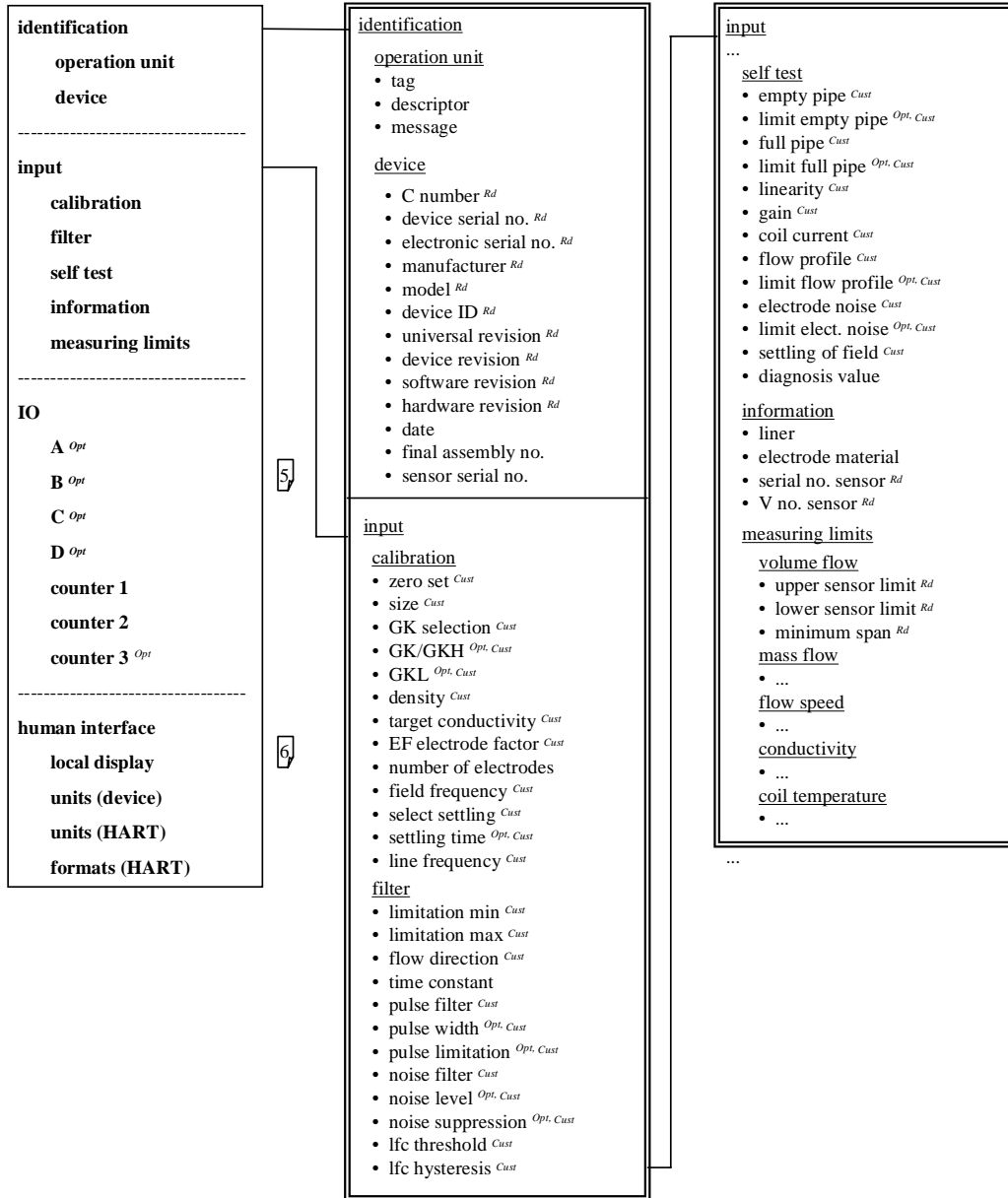
Rd Read-only

Cust Custody Lock protected

Loc Local PDM, affects only PDM views

KROHNE IFC 300 HA 45e30201 (3/6)
04.06

**IFC 300 HART Menu Tree PDM
Parameter Table**



Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local PDM, affects only PDM views

KROHNE IFC 300 HA 45e30201 (4/6)
04.06

**IFC 300 HART Menu Tree PDM
Parameter Table**

| | |
|-----------------------------|---|
| identification | 4 |
| operation unit | |
| device | |
| ----- | |
| input | 4 |
| calibration | |
| filter | |
| self test | |
| information | |
| measuring limits | |
| ----- | |
| IO | |
| A <i>Opt</i> | |
| B <i>Opt</i> | |
| C <i>Opt</i> | |
| D <i>Opt</i> | |
| counter 1 | |
| counter 2 | |
| counter 3 <i>Opt</i> | |
| ----- | |
| human interface | 6 |
| local display | |
| units (device) | |
| units (HART) | |
| formats (HART) | |

| |
|---------------------------------------|
| output |
| • terminals A <i>Cust</i> |
| • terminals B <i>Cust</i> |
| • terminals C <i>Cust</i> |
| • terminals D <i>Cust</i> |
| <u>A/B/C/D</u> <i>Opt</i> |
| <i>current output</i> <i>Opt</i> : |
| • range 0% <i>Cust</i> |
| • range 100% <i>Cust</i> |
| • ext. range min <i>Cust</i> |
| • ext. range max <i>Cust</i> |
| • error current <i>Cust</i> |
| • error condition <i>Cust</i> |
| • measurement <i>Cust</i> |
| • range min <i>Cust</i> |
| • range max <i>Cust</i> |
| • polarity <i>Cust</i> |
| • limit min <i>Cust</i> |
| • limit max <i>Cust</i> |
| • lfc threshold <i>Cust</i> |
| • lfc hysteresis <i>Cust</i> |
| • time constant <i>Cust</i> |
| • special function <i>Cust</i> |
| • rc threshold <i>Opt, Cust</i> |
| • rc hysteresis <i>Opt, Cust</i> |
| <i>frequency output</i> <i>Opt</i> : |
| • pulse shape <i>Cust</i> |
| • pulse width <i>Cust</i> |
| • 100% pulse rate <i>Cust</i> |
| • measurement <i>Cust</i> |
| • range min <i>Cust</i> |
| • range max <i>Cust</i> |
| • polarity <i>Cust</i> |
| • limit min <i>Cust</i> |
| • limit max <i>Cust</i> |
| • lfc threshold <i>Cust</i> |
| • lfc hysteresis <i>Cust</i> |
| • time constant |
| • invert signal <i>Cust</i> |
| • special function <i>Opt, Cust</i> |
| • phase shift wrt. B <i>Opt, Cust</i> |
| <i>pulse output</i> <i>Opt</i> : |
| • pulse shape <i>Cust</i> |
| • pulse width <i>Cust</i> |
| • max pulse rate <i>Cust</i> |
| • measurement <i>Cust</i> |
| • pulse value unit <i>Cust</i> |
| • value p. pulse <i>Cust</i> |
| • polarity <i>Cust</i> |
| • lfc threshold <i>Cust</i> |
| • lfc hysteresis <i>Cust</i> |
| • time constant |
| • invert signal <i>Cust</i> |
| • special function <i>Opt, Cust</i> |
| • phase shift wrt. B <i>Opt, Cust</i> |
| ... |

| |
|-----------------------------------|
| ... |
| <i>status output</i> <i>Opt</i> : |
| • mode |
| • output A <i>Opt</i> |
| • output B <i>Opt</i> |
| • output C <i>Opt</i> |
| • output D <i>Opt</i> |
| • invert signal |
| <i>limit switch</i> <i>Opt</i> : |
| • measurement |
| • threshold |
| • hysteresis |
| • polarity |
| • time constant |
| • invert signal |
| <i>control input</i> <i>Opt</i> : |
| • mode <i>Cust</i> |
| • invert signal |
| <u>counter 1/2/3</u> <i>Opt</i> |
| • function <i>Cust</i> |
| • measurement <i>Opt</i> |
| • lfc threshold <i>Opt</i> |
| • lfc hysteresis <i>Opt</i> |
| • time constant <i>Opt</i> |
| • preset value <i>Opt</i> |

Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local PDM, affects only PDM views

KROHNE IFC 300 HA 45e30201 (5/6)
04.06

**IFC 300 HART Menu Tree PDM
Parameter Table**

| | | |
|---|----------------------------|---|
| <p>identification</p> <p>operation unit</p> <p>device</p> <hr/> <p>input</p> <p>calibration</p> <p>filter</p> <p>self test</p> <p>information</p> <p>measuring limits</p> <hr/> <p>IO</p> <p>A <i>Opt</i></p> <p>B <i>Opt</i></p> <p>C <i>Opt</i></p> <p>D <i>Opt</i></p> <p>counter 1</p> <p>counter 2</p> <p>counter 3 <i>Opt</i></p> <hr/> <p>human interface</p> <p>local display</p> <p>units (device)</p> <p>units (HART)</p> <p>formats (HART)</p> | <p>4</p> <p>4</p> <p>5</p> | <p>human interface</p> <p><u>local display</u></p> <ul style="list-style-type: none"> • language • default display <i>Cust</i> <p><u>1./2. measurement page</u></p> <ul style="list-style-type: none"> • function <i>Cust</i> • measurement 1. line <i>Cust</i> • range min <i>Cust</i> • range max <i>Cust</i> • limitation min • limitation max • lfc threshold • lfc hysteresis • time constant • format 1. line • measurement 2. line <i>Cust</i> • format 2. line <i>Cust</i> • measurement 3. line <i>Cust</i> • format 3. line <i>Cust</i> <p><u>graphic page</u></p> <ul style="list-style-type: none"> • select range • range centre • range +/- • time scale <p><u>units (device)</u></p> <ul style="list-style-type: none"> • volume flow <i>Cust</i> • mass flow <i>Cust</i> • flow speed • conductivity • temperature • volume <i>Cust</i> • mass <i>Cust</i> • density <i>Cust</i> <p><u>units (HART)</u></p> <ul style="list-style-type: none"> • volume flow • mass flow • flow speed • conductivity • temperature • counter 1 • counter 2 • counter 3 <i>Opt</i> <p><u>formats (HART)</u></p> <ul style="list-style-type: none"> • volume flow <i>Loc</i> • mass flow <i>Loc</i> • flow speed <i>Loc</i> • conductivity <i>Loc</i> • temperature <i>Loc</i> • counter 1 <i>Loc</i> • counter 2 <i>Loc</i> • counter 3 <i>Opt, Loc</i> • diagnosis value <i>Opt, Loc</i> |
|---|----------------------------|---|

Designations:
Opt Optional, dependent on device implementation / configuration
Rd Read-only
Cust Custody Lock protected
Loc Local PDM, affects only PDM views