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Function blocks (FB) for process control –

Part 4: EDD interoperability guideline

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FUNCTION BLOCKS (FB) FOR PROCESS CONTROL –

Part 4: EDD interoperability guideline

FOREWORD

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Technical reports do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful by the maintenance team.

IEC 61804-4, which is a Technical Report, has been prepared by subcommittee 65C: Digital communications, of IEC technical committee 65: Industrial-process measurement and control.

The text of this Technical Report is based on the following documents:

Enquiry draft	Report on voting
65C/410/DTR	65C/417/RVC

Full information on the voting for the approval of this Technical Report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The list of all the parts of the IEC 61804 series, under the general title *Function blocks (FB) for process control*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This Technical Report

- contains an overview of the use of EDDL;
- provides examples demonstrating the use of the EDDL constructs;
- shows how the use cases are fulfilled; and
- shows the proper EDD application interpretation for each example.

This Technical Report is not an EDDL tutorial and is not intended to replace the EDDL specification.

Instructions are provided for the EDD application, which describe what is to be performed without prescribing the technology used in the host implementation. For example, the FILE construct describes data that is to be stored by the EDD application on behalf of the EDD. The FILE construct does not specify how the data is to be stored. The EDD application can use a database, a flat file, or any other implementation it chooses.

FUNCTION BLOCKS (FB) FOR PROCESS CONTROL –

Part 4: EDD interoperability guideline

1 Scope

This part of IEC 61804 is a guideline to support EDD interoperability.This Technical Report is intended to ensure that field device developers use the EDDL constructs consistently and that the EDD applications have the same interpretations of the EDD. It supplements the EDDL specification to promote EDDL application interoperability and improve EDD portability between EDDL applications.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-351, *International Electrotechnical Vocabulary (IEV) – Part 351: Automatic control*

IEC 61804-2:2006, *Function blocks (FB) for process control – Part 2: Specification of FB concept*

IEC 61804-3:2006 *Function blocks (FB) for process control – Part 3: Electronic Device Description Language (EDDL)*

ISO/IEC 15948:2004, *Information technology – Computer graphics and image processing – Portable Network Graphics (PNG) – Functional specification*

3 Terms, definitions, abbreviated terms and acronyms

3.1 Terms and definitions

For the purposes of this document, some of the terms and definitions in IEC 60050-351, as well as the following, some of which have been compiled from the referenced documents, apply.

3.1.1
EDD developer
individual or team that develops an EDD

3.1.2
EDD application
software or programmes utilizing the EDD to guide the operation of the application

NOTE These applications include configuration tools, calibrators, instrument management packages, and instrument simulators

3.1.3
end user
individual using the field device and/or the EDDL application

3.2 Abbreviated terms and acronyms

CP Communication Profile

CPF Communication Profile Family

EDD Electronic Device Description. A platform and application-independent model or description of a field device written using EDDL. An EDD describes the properties, standard procedures and status associated with a device.

EDDL Electronic Device Description Language

FF Fieldbus Foundation; see www.fieldbus.org

HCF HART® Communication Foundation; see www.hartcomm.org

OPC Open connectivity; OPC Foundation; see www.opcfoundation.org

PC Personal computer

PNO PROFIBUS Nutzerorganisation e.V.; see www.profibus.com

4 User interface support

4.1 Overview

Most EDD applications can be characterized as either a PC application or a hand-held application. Due to the relatively small screen of a hand-held device, hand-held applications can only display a small amount of information at any given time. On the other hand, PC applications can provide a much more beneficial user interface, largely due to their larger screen size.

To support the capabilities of PC applications, the MENU construct has been extended in IEC 61804-3 compared to IEC 61804-2. Due to the differences in the user interfaces of PC applications and hand-held applications, it is expected that many devices will define two MENU hierarchies – one for hand-held applications and the other for PC applications. Some MENUs may be used in both hierarchies. Therefore, the entire hierarchy need not be specified twice.

Different menu structures for different classes of applications are possible. This guideline may be used to create menu structures in an EDD that are interpreted by applications in an unambiguous way. To promote interoperability across applications, it is highly recommended that all EDD applications follow this guideline.

4.2 Menu conventions for applications

There are existing solutions for hand-held application menus and these solutions can be used. This technical report does not provide specific conventions for hand-held applications.

4.3 Menu conventions for PC-based applications

4.3.1 Overview

EDD applications use special menus in the EDDs to show the user interface of the device. Such menus are defined for diagnostic, process variables, device features, and offline configuration. Defined identifiers are defined for the different root menus. Other submenus can be underneath these root menus.

4.3.2 Diagnostic

The diagnostic menu includes views that show the device state, detailed diagnostic information and may include graphical views that show, for example, a valve signature.

4.3.3 Process variables

The process variable menu includes views that show process measurements and set points with their quality and important information for process operators, for example, ranges.

4.3.4 Device features

The device feature menu includes features for device support. These features can be split into process-related and device-specific features. This structure is not required if the number of features is too small for splitting. Submenus that represent any structuring are allowed on the device feature menu. In case of such submenus, the menus that are underneath can be split into process-related and device-specific features.

4.3.5 Offline configuring

This menu hierarchy includes parameters, variables, and methods for offline configuration. It contains, in particular, all of the application-specific parameters of the device and may also contain important read-only and writeable variables. For more information about application-specific parameters, see 4.4. The menu can have offline methods, for example, configuration assistants.

4.3.6 Overview defined identifiers

Table 1 lists defined menu identifiers.

Table 1 – List of defined menu identifiers

Menu Identifier	Short description
diagnostic_root_menu	Diagnostic view
process_variables_root_menu	Process variable views
device_root_menu	Device feature views
offline_root_menu	Menu hierarchy for offline configuration

4.3.7 Example of EDD menu structure

This is an example of additional menus that can be added to an EDD for PC applications. These menus are additional to the existing menus for the applications. This example is HART-specific. Examples for Foundation Fieldbus[1] and PROFIBUS[2] would be very similar.

```
MENU diagnostic_root_menu
{
    LABEL "Diagnostics";
    STYLE MENU;
    ITEMS
    {
        status_window,              /* menu: style=window */
          self_test                 /* method */
    }
}

MENU status_window
{
    LABEL "Status";
    STYLE WINDOW;
    ITEMS
    {
        standard_diagnostics_page,  /* menu: style=page */
        devspec_diagnostics_page    /* menu: style=page */
    }
}
```

---

1 Communication Profile Family CPF 1 according to IEC 61784-1:2003, *Digital data communications for measurement and control – Part 1: Profile sets for continuous and discrete manufacturing relative to fieldbus use in industrial control systems.*

2 CP3/1 and CP3/2 of Communication Profile Family CPF 3 according to IEC 61784-1 (see footnote 3).

```
MENU standard_diagnostics_page
{
    LABEL "Standard";
    STYLE PAGE;
    ITEMS
    {
        device_status               /* variable */
    }
}

MENU devspec_diagnostics_page
{
    LABEL "Device Specific";
    STYLE PAGE;
    ITEMS
    {
        xmtr_specific_status_1,     /* variable */
        xmtr_specific_status_2      /* variable */
    }
}

METHOD self_test
{
    LABEL "Self Test";
    DEFINITION
    {
        /* elided */
    }
}

MENU process_variables_root_menu
{
    LABEL "Process Variables";
    STYLE MENU;
    ITEMS
    {
        overview_window,            /* menu: style=window */
        primary_vars_window         /* menu: style=window */
    }
}

MENU overview_window
{
    LABEL "Overview";
    STYLE WINDOW;
    ITEMS
    {
        process_vars_page           /* menu: style=page */
    }
}

MENU process_vars_page
{
    LABEL "Process Variables";
    STYLE PAGE;
    ITEMS
    {
        pressure_group,             /* menu: style=group */
        temperature_group           /* menu: style=group */
    }
}

MENU pressure_group
{
    LABEL "Pressure";
    STYLE GROUP;
    ITEMS
    {
        pv_digital_value,           /* variable */
        pv_upper_range_value,       /* variable */
        pv_lower_range_value        /* variable */
    }
}

MENU temperature_group
{
    LABEL "Temperature";
    STYLE GROUP;
    ITEMS
    {
        sv_digital_value,           /* variable */
        sv_upper_range_value,       /* variable */
        sv_lower_range_value        /* variable */
```

```
    }
}

MENU primary_vars_window
{
    LABEL "Primary Variables";
    STYLE WINDOW;
    ITEMS
    {
        pressure_chart_page,          /* menu: style=page */
        temperature_chart_page        /* menu: style=page */
    }
}

MENU pressure_chart_page
{
    LABEL "Pressure";
    STYLE PAGE;
    ITEMS
    {
        pressure_chart                /* chart */
    }
}

CHART pressure_chart
{
    /* elided */
}

MENU temperature_chart_page
{
    LABEL "Temperature";
    STYLE PAGE;
    ITEMS
    {
        temperature_chart             /* chart */
    }
}

CHART temperature_chart
{
    /* elided */
}

MENU device_root_menu
{
    LABEL "Device";
    STYLE MENU;
    ITEMS
    {
        process_related_window,       /* menu: style=window */
        device_specific_window,       /* menu: style=window */
        master_reset                  /* method */
    }
}

MENU process_related_window
{
    LABEL "Process Related";
    STYLE WINDOW;
    ITEMS
    {
        identification_page,          /* menu: style=page */
        output_info_page              /* menu: style=page */
    }
}

MENU identification_page
{
    LABEL "Identification";
    STYLE PAGE;
    ITEMS
    {
        tag,                          /* variable */
        manufacturer,                 /* variable */
        device_type,                  /* variable */
        device_revision,              /* variable */
        descriptor,                   /* variable */
        message                       /* variable */
    }
}
```

```
MENU output_info_page
{
    LABEL "Output Information";
    STYLE PAGE;
    ITEMS
    {
        range_values_group,          /* menu: style=group */
        sensor_limits_group          /* menu: style=group */
    }
}

MENU range_values_group
{
    LABEL "Range Values";
    STYLE GROUP;
    ITEMS
    {
        pv_units,                    /* variable */
        pv_urv,                      /* variable */
        pv_lrv                       /* variable */
    }
}

MENU sensor_limits_group
{
    LABEL "Sensor Limits";
    STYLE GROUP;
    ITEMS
    {
        sensor_units,                /* variable */
        upper_sensor_limit,          /* variable */
        lower_sensor_limit           /* variable */
    }
}

MENU device_specific_window
{
    LABEL "Device Specific";
    STYLE WINDOW;
    ITEMS
    {
        identification_page,         /* menu: style=page */
        calibration_page             /* menu: style=page */
    }
}

MENU calibration_page
{
    LABEL "Calibration";
    STYLE PAGE;
    ITEMS
    {
        sensor_limits_group,         /* menu: style=group */
        sensor_trim_group            /* menu: style=group */
    }
}

MENU sensor_trim_group
{
    LABEL "Sensor Trim";
    STYLE GROUP;
    ITEMS
    {
         upper_sensor_trim_point,    /* variable */
         lower_sensor_trim_point,    /* variable */
         sensor_trim                 /* method */
    }
}

METHOD master_reset
{
    LABEL "Master Reset";
    DEFINITION
    {
        /* elided */
    }
}
```