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HARPS EGGS Mode Data Interface Control Document

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1. INTRODUCTION

1.1 PURPOSE

This document covers about changes in the data control interface of the HARPS system due the inclusion of the **Harps High Efficiency Fiber Shutter Switch** control software for 3.6m Telescope. The document is intended for DICB, software developers, HARPS' Team and other team member who may participle in development and maintain of the **HEFS** control software. The audience is supposed to be familiar with the **VLT Common Software's** standards.

1.2 SCOPE

The present describes the modifications to the data control interface of the actual **HARPS** system after adapting the new **HEFS**. This implies adding new keywords to dictionaries, modifications in templates, and fits files header.

1.3 APPLICABLE DOCUMENTS

The following documents, of the exact issue shown, form a part of this document to the extent specified herein. In the event of conflict between the documents referenced herein and the contents of this document, the contents of this document shall be considered a superseding requirement.

[1] 3M6-SPE-ESO-13100-0012, Issue 1.3, 14/12/2004 --- High Efficiency Mode Upgrade
[2] 3P6-DSD-ESO-60400-0002, Issue 1.0, 24/12/2004 --- Harps High Efficiency Fiber Shutter
[3] 3P6-TRE-ESO-70200-0001, Issue 1.0, 12/07/2004 --- High Efficiency Fiber Head for Harps

1.4 REFERENCE DOCUMENTS

The following documents are referenced in this document.

[4] VLT-MAN-ESO-17210-0364, Issue 2.0, 11/06/2002 --- Digital I/O Driver User Manual
[5] VLT-MAN-ESO-17240-2240, Issue 4.0, 31/03/2004 --- INS Common SW for Template User Manual
[6] VLT-MAN-ESO-17240-0934, Issue 5.0, 31/03/2004 --- INS Common SW Base ICS User Manual
[7] 3M6-MIN-ESO-33100-0009, 22/07/2002 --- IST meeting recommending EGGS
[8] 3M6-SPE-ESO-13100-0012, 05/03/2004 --- User Requirements
[9] 3P6-TRE-ESO-70200-001, 12/07/2004 --- PDR Document
[10] 3M6-MIN-HAR-33100-0031, 23/08/2005 --- Minutes of PDR and reviewer comments
[11] INS-04/17 --- Fiber Splicing test
[12] 3P6-DSD-ESO-80030-0005, Issue 1.5, 15/05/2005 --- Harps HE Software Design Description

1.5 ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms are used in this document:

HARPS	High Accuracy Radial velocity Planet Searcher
EGGS	Extra Good General Spectroscopy
HEFS	High Efficiency Fiber Shutter Switch
ICS	Instrument Control Software
OCS	Control Software
OLDB	Online Data Base

TSF	Template Signature File
REF	Reference Setup File
ISF	Instrument Summary File
SEQ	Template Script File
IP	Instrument Package
FDR	Final Design Review
LSO	La Silla Observatory
N/A	Not Applicable
TBC	To Be Confirmed
TBD	To Be Defined

1.6 GLOSSARY

1.7 STYLISTIC CONVENTIONS

This subsection is optional. Use it if it makes sense. The following is just an example. Change it according to your needs.

The following styles are used:

Bold
: In the text, for commands, filenames, pre-suffixes as they have to be typed.

Italic
: In the text, for parts that have to be substituted with the real content before typing.

`Teletype`
: For examples.

`<name>`
: in the examples, for parts that have to be substituted with the real content before typing.

Bold and *italic* are also used to highlight words.

2. OVERVIEW

The inclusion of the new instrument mode **EGGS** [12] in the **HARPS** system implies that we need to change the actual data control interface of **HARPS** in order to support this new feature. This means modifications in **dicHARPS**, **haotsf**, **haoseq**, **hamtsf** and **hamseq** modules.

Note that actual modes, **HARPS, CES, DARK**, will remain untouched.

3. DATA INTERFACE CONTROL

3.1 Instrument Modes

The introducing of the new device **hefs** implies that we must redefine the actual structure of Instrument Modes. Actually, **HARPS** has three Instrument Modes: **HARPS**, **CES**, and **DARK**. The **HARPS** mode will be updated to use the **HARPS** shutter. On the other hand, a new Instrument mode named **EGGS** will be defined. Templates which use the **EGGS** mode will select to use the **EGGS** shutter and the high efficiency fiber (setting properly the fiber carriage position).

The **HARPS** instrument mode will be kept untouched in order to facilitate the backward compatibility.

The modification of the instrument modes will be done in the **hamcfgINS.cfg** configuration file at **hamcfg** module.

```
#
# Instrument modes
#
OCS.MODE1.NAME       "HARPS";
OCS.MODE1.SETUP      "-function INS.OPTI2.NAME HARPS INS.HEFS.ST F";
OCS.MODE1.SUBSYST    "FIERA ICS 3P6";
OCS.MODE1.PATH       "DEFAULT";

OCS.MODE2.NAME       "CES";
OCS.MODE2.SETUP      "-function INS.OPTI2.NAME CES";
OCS.MODE2.SUBSYST    "FIERA ICS 3P6";
OCS.MODE2.PATH       "DEFAULT";

OCS.MODE3.NAME       "DARK";
OCS.MODE3.SETUP      "-function INS.ADC OFF INS.OPTI2.NAME PARK INS.COVER IN INS
    .LAMP OFF INS.SHUT1.ST F"
OCS.MODE3.SUBSYST    "FIERA ICS 3P6";
OCS.MODE3.PATH       "DEFAULT";

OCS.MODE4.NAME       "EGGS”;
OCS.MODE4.SETUP      "-function INS.OPTI2.NAME CES INS.HEFS.ST T";
OCS.MODE4.SUBSYST    "FIERA ICS 3P6";
OCS.MODE4.PATH       "DEFAULT";
```

3.2 Device Configuration

The new device **hefs** should be defined at **hamcfg/config/hamcfgINS.cfg** configuration file. Note that the prefix of the **hefs** device is “**INS.HEFS**”, this imply all keywords related to the **hefs** device will appear in the **fits** header using its prefix, which is clearer than using its configuration keyword “**INS.DIG2**”. For example:

```
HIERARCH ESO INS HEFS ST = T / High Eff. Fiber Shutter Switch, T=EGGS, F=HARPS
```

Also the setup command will be

```
SETUP –function INS.HEFS.ST T
```

The **hefs** device will be configured as follow:

```
# HEFS: high efficiency fiber shutter switch

INS.DIG2.DEVNAME        "hefs";
INS.DIG2.DEVDESC        "High Efficiency Fiber Shutter Switch";
INS.DIG2.PREFIX         "INS.HEFS";
INS.DIG2.PARAM          "ST";
INS.DIG2.LCUID          1; # Id. of the LCU managing the device
INS.DIG2.SWSIM          F; # If T, function is software simulated
INS.DIG2.TIMEOUT        5; # Motion timeout
INS.DIG2.SIGDEV         "/acro0";

INS.DIG2.OUTBIT         30;
INS.DIG2.OUTLOW         T;

INS.DIG2.INNAME1        "LocalI";
INS.DIG2.INBIT1         31;
INS.DIG2.INLOW1         T; # T=handset F=remote

INS.DIG2.INNAME2        "HEFSSelectFeedBackI";
INS.DIG2.INBIT2         32;
INS.DIG2.INLOW2         T; # T=EGGS; F=HARPS

INS.DIG2.POSID1         "HARPS"; # position 1: ST=F
INS.DIG2.OUTVAL1        0;
INS.DIG2.INVAL12        0;

INS.DIG2.POSID2         "EGGS"; # position 2: ST=T
INS.DIG2.OUTVAL2        1;
INS.DIG2.INVAL22        1;
```

3.3 Keywords and Dictionary

New keywords to support the new device and the new instrument mode will be added at **dicHARPS** module.

The **hefs** device [12] will be configured as a digital device (`INS.DIGi`), so there is no need to create new keywords for the configuration dictionary **ESO-VLT-DIC.HARPS_CFG** since HARPS has already a digital device, **i2cfa** (I2 Cell Power Switch). But in order to use the prefix **INS.HEFS**, it will be necessary to update it into **ESO-VLT-DIC.HARPS_ICS** dictionary so the **ICS** won't reject the **SETUP** command.

The following is a list of new keywords which should be created, after their acceptance by **DICDB**:

```
INSi.HEFS.ST      %c    High Eff. Fiber Shutter, T=EGGS, F=HARPS (ch)
                        If T, the EGGS shutter will be used.
                        If F, the HARPS shutter will be used.

INSi.HEFS.SWSIM   %c    If T, function is software simulated (ch)
```

3.4 Templates

Due the changes in the instrument modes, all the templates should be adapted. Since the modification of **TSF** files and the **ISF** file, the Instrument Package of **HARPS** should be updated as well.

3.4.1 Template Signature Files (TSF)

The **Harps**' **TSF** files are located at **haotsf** and **hamtsf** modules.
The actual **TSF** files for **HARPS** instrument mode will remain untouched. These are listed below:

```
haotsf/config
            |- HARPS_ech_acq_I2cell.tsf
            |- HARPS_ech_acq_objA.tsf
            |- HARPS_ech_acq_objAB.tsf
            |- HARPS_ech_acq_thosimult.tsf
            |- HARPS_ech_cal_I2AB.tsf
            |- HARPS_ech_cal_I2AthoB.tsf
            |- HARPS_ech_cal_bias.tsf
            |- HARPS_ech_cal_dark.tsf
            |- HARPS_ech_cal_focus.tsf
            |- HARPS_ech_cal_thoAB.tsf
            |- HARPS_ech_cal_tun.tsf
            |- HARPS_ech_cal_tunAB.tsf
            |- HARPS_ech_cal_tunAI2.tsf
            |- HARPS_ech_obs_all.tsf
```

For the new **EGGS** instrument mode, the following **TSF** files will be created. They will be based on the old **TSF** file, only their names and the corresponding instrument mode will be updated for each one of them.

```
haotsf/config
            |- HARPS_eggs_acq_I2cell.tsf
            |- HARPS_eggs_acq_objA.tsf
            |- HARPS_eggs_acq_objAB.tsf
            |- HARPS_eggs_acq_thosimult.tsf
            |- HARPS_eggs_cal_I2AB.tsf
            |- HARPS_eggs_cal_I2AthoB.tsf
            |- HARPS_eggs_cal_bias.tsf
            |- HARPS_eggs_cal_dark.tsf
            |- HARPS_eggs_cal_focus.tsf
            |- HARPS_eggs_cal_thoAB.tsf
            |- HARPS_eggs_cal_tun.tsf
            |- HARPS_eggs_cal_tunAB.tsf
            |- HARPS_eggs_cal_tunAI2.tsf
            |- HARPS_eggs_obs_all.tsf
```

In case of maintenance templates, the actual **TSF** are:

```
hamtsf/config
            |- HARPS_ech_tec_eff.tsf
            |- HARPS_ech_tec_free.tsf
            |- HARPS_ech_tec_led.tsf
            |- HARPS_ech_tec_thoA.tsf
            |- HARPS_ech_tec_thoAB.tsf
            |- HARPS_ech_tec_thoB.tsf
            |- HARPS_ech_tec_tunA.tsf
            |- HARPS_ech_tec_tunAB.tsf
            |- HARPS_ech_tec_tunB.tsf
            |- HARPS_ech_tec_TestAll.tsf
```

And the following new files will be created for **EGGS** instrument mode:

```
hamtsf/config
            |- HARPS_eggs_tec_eff.tsf
            |- HARPS_eggs_tec_free.tsf
            |- HARPS_eggs_tec_led.tsf
            |- HARPS_eggs_tec_thoA.tsf
            |- HARPS_eggs_tec_thoAB.tsf
            |- HARPS_eggs_tec_thoB.tsf
            |- HARPS_eggs_tec_tunA.tsf
            |- HARPS_eggs_tec_tunAB.tsf
```

```
            |- HARPS_eggs_tec_tunB.tsf
            |- HARPS_eggs_tec_TestAll.tsf
```

3.4.2 Instrument Summary File (ISF)

The **ISF** file of **HARPS** (haotsf/config/HARPS.isf) should be updated too, in order to support the new instrument modes. The **MODES** parameter has to be updated as following:

MODES "HARPS CES DARK EGGS"

3.4.3 Reference Setup File (REF)

The **REF** files should be duplicated and updated with the corresponded instrument mode.

These **REF** files will remain untouched:

```
haotsf/config
            |- HARPS_ech_acq_I2cell.ref
            |- HARPS_ech_acq_objA.ref
            |- HARPS_ech_acq_objAB.ref
            |- HARPS_ech_acq_thosimult.ref
            |- HARPS_ech_cal_I2AB.ref
            |- HARPS_ech_cal_I2AthoB.ref
            |- HARPS_ech_cal_bias.ref
            |- HARPS_ech_cal_dark.ref
            |- HARPS_ech_cal_focus.ref
            |- HARPS_ech_cal_thoAB.ref
            |- HARPS_ech_cal_tun.ref
            |- HARPS_ech_cal_tunAB.ref
            |- HARPS_ech_cal_tunAI2.ref
            |- HARPS_ech_obs_all.ref

hamtsf/config
            |- HARPS_ech_tec_dark.ref
            |- HARPS_ech_tec_eff.ref
            |- HARPS_ech_tec_free.ref
            |- HARPS_ech_tec_led.ref
            |- HARPS_ech_tec_thoA.ref
            |- HARPS_ech_tec_thoAB.ref
            |- HARPS_ech_tec_thoB.ref
            |- HARPS_ech_tec_tunA.ref
            |- HARPS_ech_tec_tunAB.ref
            |- HARPS_ech_tec_tunB.ref
            |- HARPS_gen_tec_TestAll.ref
```

The following **REF** files will be created.

```
haotsf/config
            |- HARPS_eggs_acq_I2cell.ref
            |- HARPS_eggs_acq_objA.ref
            |- HARPS_eggs_acq_objAB.ref
            |- HARPS_eggs_acq_thosimult.ref
            |- HARPS_eggs_cal_I2AB.ref
            |- HARPS_eggs_cal_I2AthoB.ref
            |- HARPS_eggs_cal_bias.ref
            |- HARPS_eggs_cal_dark.ref
            |- HARPS_eggs_cal_focus.ref
```

```
            |- HARPS_eggs_cal_thoAB.ref
            |- HARPS_eggs_cal_tun.ref
            |- HARPS_eggs_cal_tunAB.ref
            |- HARPS_eggs_cal_tunAI2.ref
            |- HARPS_eggs_obs_all.ref

hamtsf/config
            |- HARPS_eggs_tec_dark.ref
            |- HARPS_eggs_tec_eff.ref
            |- HARPS_eggs_tec_free.ref
            |- HARPS_eggs_tec_led.ref
            |- HARPS_eggs_tec_thoA.ref
            |- HARPS_eggs_tec_thoAB.ref
            |- HARPS_eggs_tec_thoB.ref
            |- HARPS_eggs_tec_tunA.ref
            |- HARPS_eggs_tec_tunAB.ref
            |- HARPS_eggs_tec_tunB.ref
            |- HARPS_eggs_tec_TestAll.ref
```

3.4.4 Template script (SEQ)

The actual set of **SEQ** files will be kept untouched, and shared between both **HARPS** and **EGGS** instrument modes.

```
haoseq/src
            |- HARPS_ech_acq_I2cell.seq
            |- HARPS_ech_acq_objA.seq
            |- HARPS_ech_hacq_objAB.seq
            |- HARPS_ech_acq_thosimult.seq
            |- HARPS_ech_cal_I2AB.seq
            |- HARPS_ech_cal_I2AthoB.seq
            |- HARPS_ech_cal_bias.seq
            |- HARPS_ech_cal_dark.seq
            |- HARPS_ech_cal_focus.seq
            |- HARPS_ech_cal_thoAB.seq
            |- HARPS_ech_cal_tun.seq
            |- HARPS_ech_cal_tunAB.seq
            |- HARPS_ech_cal_tunAI2.seq
            |- HARPS_ech_cal_tunUSER.seq
            |- HARPS_ech_obs_all.seq
```

3.5 Scanlinks

The Status of the new device which is saved at **lhaics1**'s OLDB should be mapped by scanlinks into wharps' OLDB.

The following points should be added at **hai/config/lhaics1.scan** file.

```
#
# HEFS: High Efficiency Fiber Switch
#

<alias>HEFS.state       <alias>HEFS.state       SRBX  2
<alias>HEFS.simulation  <alias>HEFS.simulation  SRBX  2
<alias>HEFS.handset     <alias>HEFS.localI      SRBX  2
<alias>HEFS.status0     <alias>HEFS.status0     SRBX  2
```

```
<alias>HEFS.value1I     <alias>HEFS.value1I     SRBX  2
```

