HUSSMANN®

CoreLink™

Full Trans-critical Efficiency Application

Full Trans -critical Efficiency (FTE)

Application Version – 3.8/4.0

IMPORTANT

Keep in factory for

future reference!

Introduction and Requirements

Purpose of this manual is to provide field service personnel the information necessary for FTE Application

Full Trans-critical Efficiency (FTE)

The Full Trans-critical Efficiency(FTE) AKA Liquid Flood back enabled system employs a low-pressure liquid receiver to flood medium temperature evaporators with liquid CO_2. This eliminates superheat and allows the evaporation temperature in the cabinets – and ultimately the efficiency of the system – to increase.
From the case controller standpoint, this is what happens:

- The case is started in normal refrigeration mode, and will maintain a target discharge air temperature and superheat setpoint
- The system will be put into FTE mode during the startup and commissioning period, which changes the controller to manage discharge air, allowing the coil to fill. The valve will modulate only once discharge air is below setpoint
- Once stabilized, the refrigeration system controller will increase the evaporator temperature by altering system parameters and monitoring the return tank

Software Requirements

➢ Following versions or higher versions of software packages are configured within the CoreLink and are required to support FTE functionality

- CoreLink
  - Application Version 3.8 or higher

Bios Version: 2020052000	Web UI Version: 2.5.0
Application Version: 3.8.0	Application Date Code: 11122

➢ E2 Description file should be **version 9** or higher to use FTE feature

Overview

➢ FTE can be Enabled/Disabled in CoreLink in different ways as below
1. Enable/Disable FTE through Command menu of CoreLink
2. Enable/Disable FTE through CoreLink digital input
3. Enable/Disable FTE through system manager network command

Notes:- By default FTE is disabled in CoreLink and Digital input is not configured. Field configuration is required if enabling FTE through Digital Input.

➢ FTE is enabled in CoreLink during the Refrigeration mode.
➢ If FTE mode is enabled during defrost CoreLink completes the defrost cycle and then goes to FTE mode.
➢ During FTE mode, the low superheat shutdown threshold values are automatically changed to -40 degrees and the Minimum Superheat alarm changed to -45 degrees

Superheat Alarm ❶

Min SH Alarm 1:	-45.0	(-25 to 30.0) °F
Min SH Alarm 2:	-45.0	(-25 to 30.0) °F
Min SH Alarm 3:	-45.0	(-25 to 30.0) °F

Low Superheat Safeties

| Low SH shutdown 1:	-40.0	(0 to 30) °F
Low SH shutdown 2:	-40.0	(0 to 30) °F
Low SH shutdown 3:	-40.0	(0 to 30) °F

➢ When FTE mode is disabled, the low superheat shutdown threshold values are automatically changed back to previous configuration values
➢ In the Analysis page, the Control Status logs FTE when its enabled
➢ If there is communication lost from System manager, CoreLink will maintain the same mode as previously configured.
➢ When multiple FTE modes are enabled (System manager, Digital input) then CoreLink will enable FTE mode with any one or both initiatives.

| CoreLink Status	System manager	Corelink DI
REFR	Off	Off
FTE	On	Off
FTE	Off	On
FTE	On	On

Enabling FTE through CoreLink Command Menu

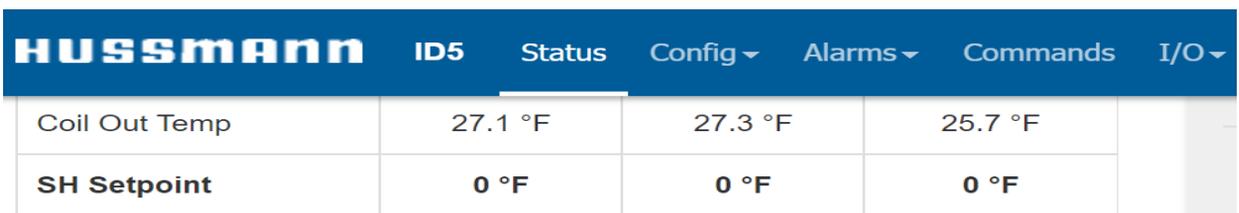## 1. Enabling FTE mode with the CoreLink Command

- FTE can be enabled in CoreLink via command menu with the CoreLink UI
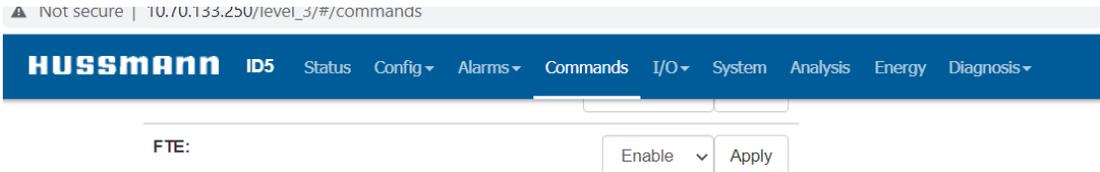
- When FTE is enabled, the status of the CoreLink changes to FTE which can be viewed on the UI status page and on the remote display also.
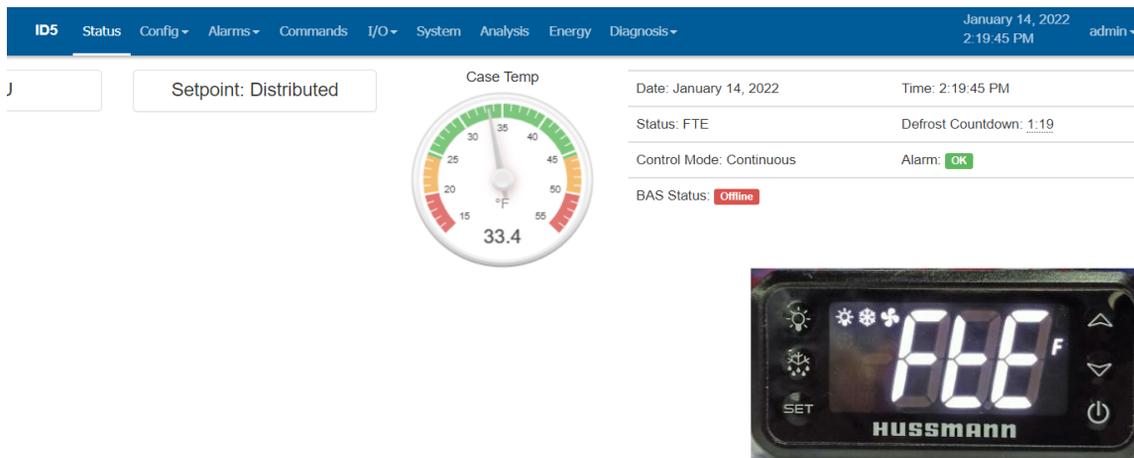
- After enabling FTE mode, the Superheat set point is changed to 0 which can be shown on the status page

- When in FTE mode, the refrigeration PID is adjusted in controller to open the valve when discharge air raises above setpoint
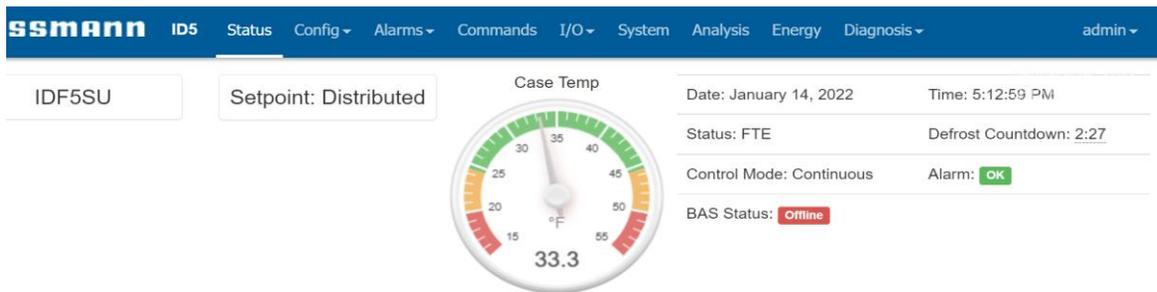
Enabling FTE through CoreLink Digital Input

1. Enabling FTE mode through the CoreLink Digital Input

- FTE can be enabled in CoreLink via Digital Input, below is the configuration, FTE can be configured to any spare Digital input by default it is configured as below

DIC08 (Pin 27):	Drain Sensor ∨	DIP08 (Pin 27):	Close ∨
DIC09 (Pin 28):	FTE ∨	DIP09 (Pin 28):	Close ∨

- When FTE is enabled on a digital input and input is triggered, the status of the CoreLink changes to FTE which can be viewed on the Web UI status page

| SSMANN | ID5 | Status | Config ▾ | Alarms ▾ | Commands | I/O ▾ | System | Analysis | Energy | Diagnosis ▾ | admin ▾ |

| IDF5SU | Setpoint: Distributed |

Case Temp

33.3

Date: January 14, 2022   Time: 5:12:59 PM
Status: FTE   Defrost Countdown: 2:27
Control Mode: Continuous   Alarm: OK
BAS Status: Offline

- After enabling FTE mode, the Superheat set point changes to 0 which can be seen on the status page

| HUSSMANN | ID5 | Status | Config ▾ | Alarms ▾ | Commands | I/O ▾ | System | Analysis | Energy |

Valve Position	85 %	85 %	85 %		Evap Fan:
Coil Out Temp	27.1 °F	27.3 °F	25.7 °F		Cond Fan:
SH Setpoint	0 °F	0 °F	0 °F		

- When controller is running in FTE mode refrigeration PID is adjusted in controller to open the valve when discharge air raises above setpoint

Disabling FTE through CoreLink Command Menu

1. Disabling FTE mode with the CoreLink Command

- FTE can be disabled in CoreLink via command menu with the CoreLink UI

- When FTE is disabled, the status of the CoreLink reverts to REFR which can be viewed on the UI status page

- After disabling FTE mode, the Superheat set point reverts to previous SH setpoint which can be shown on the status page

Coil Out Temp	27.1 F	27.3 F	23.7 F
SH Setpoint	5 °F	5 °F	5 °F

Disabling FTE through CoreLink Digital Input

1. FTE can be disabled in CoreLink via Digital input

- FTE can be disabled in CoreLink by removing the 24V signal to the Digital Input

- When FTE is disabled, the status of the CoreLink reverts to REFR which can be viewed on the UI status page

Date: January 18, 2022	Time: 5:52:02 PM
Status: REFR	Defrost Countdown: 1:49
Control Mode: Continuous	Alarm: OK
BAS Status: Offline	

- After disabling FTE mode, the Superheat set point reverts to previous SH setpoint which can be shown on the status page

Coil Out Temp	27.1 F	27.3 F	23.7 F
SH Setpoint	5 °F	5 °F	5 °F

Enabling FTE in CoreLink through E2

- FTE can be enabled in CoreLink via E2 network command within the Inputs-net tab

Property:	Value:
AMBLIGHTNETWORK	0
DEFROSTINIT_NET	NA
DEFRTERM_NET	NA
ENDWAITCMD	NA
DEWPOINTNETWORK	0
DUALTEMPNETWORK	OFF
ENABLENETWORK	ON
PRESSURENETWORK	0
REFRIGDISABLNET	OFF
LIGHTCONTROLNET	ON
FTE/SH OPT	ON

(Tabs: General | Refrig | Outputs-out | AlarmSetpts | Overrides | Outputs-in | AlrmOuts | AlrmOut-MDS | Inputs-NET)

- When FTE is enabled, the status of the CoreLink changes to FTE which can be viewed on the E2 status page

- After enabling FTE mode active set point of Superheat is changed to 0 which can be shown on the E2 status page

- Active SH-1/2/3 is only applicable to FTE mode and is not considered in any other control applications.

Note – E2 Description file **version 9** or higher supports FTE feature

Disabling FTE in CoreLink through E2

- FTE can be disabled in CoreLink via E2 network command within the Inputs-net tab

General	Refrig	Outputs-out	AlarmSetpts	Overrides	Outputs-in	AlrmOuts	AlrmOut-MDS	Inputs-NET

Property:	Value:
AMBLIGHTNETWORK	0
DEFROSTINIT_NET	NA
DEFRTERM_NET	NA
ENDWAITCMD	NA
DEWPOINTNETWORK	0
DUALTEMPNETWORK	OFF
ENABLENETWORK	ON
PRESSURENETWORK	0
REFRIGDISABLNET	OFF
LIGHTCONTROLNET	ON
FTE/SH OPT	OFF

- When FTE is disabled, the status of the CoreLink reverts to REFR and the Active SH setpoints revert to configured Super Heat setpoints.