



Ensite Pro to CIU 888 Migration Manual

Release R210

PREFACE

General

Commissioning is the first step following the installation of the CIU 888. During commissioning, the CIU 888 site configuration is created and site elements such as gauges, tanks and the CIU 888 are configured. When the site is in operation and there are changes, for example a gauge is added or an additional host system is connected, these changes need to be implemented, and the CIU 888 needs to be updated with the new site configuration.

Purpose of this manual

The purpose of this manual is to provide information about the commissioning and configuration of the CIU 888.

Target audience of this manual

This manual is primarily intended for service technicians who are responsible for commissioning and configuration of the CIU 888, and for the migration of an existing CIU 880 Prime/Plus site configuration to the CIU 888.

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Table of Contents

TABLE OF CONTENTS

Preface	i
General	i
Purpose of this manual	i
Target audience of this manual	i
Table of contents	iii
CHAPTER 1	1-1
1.1 Minimum System Requirements	1-2
1.2 Ensite Pro	1-2
1.2.1 Launching Ensite Pro	1-2
1.3 Ensite Pro to CIU 888 Migration tool	1-4
1.3.1 Launching the Ensite Pro to CIU 888 Migration tool	1-4
1.4 CIU 888 Web interface	1-5
1.4.1 Changing the settings of Internet Explorer	1-5
1.4.2 Changing the settings of Google Chrome	1-12
1.4.3 Launching the CIU 888 Web interface	1-17
CHAPTER 2 Commissioning of a Standalone System Setup	2-1
2.1 Requirements for commissioning	2-1
2.2 Running the initial setup of the CIU 888	2-2
2.2.1 Logging on to the CIU 888 and changing the initial password	2-2
2.2.2 Verifying the CIU 888 license	2-4
2.3 Setting up the site configuration and generating INI files	2-6
2.3.1 Supported topologies of deployment	2-6
2.3.1.1 Single CIU Prime	2-7
2.3.1.2 Single pair of CIU Plus and CIU Prime	2-8
2.3.2 Mapping of host ports	2-8
2.3.3 Configuration procedure in Ensite Pro	2-10
2.3.4 Generating INI files	2-12
2.4 Uploading the site configuration to the CIU 888	2-12
2.5 Configuring the additional configuration settings of the CIU 888	2-14
2.5.1 954 Servo gauge integration with Entis Pro	2-17
2.6 End commissioning of the CIU 888	2-19
2.7 Updating the INI files	2-21
2.8 Restarting Entis Pro and loading the updated INI files in Entis Pro	2-22
2.9 Sealing the CIU 888	2-22
2.10 Verifying the working of the system setup	2-22
CHAPTER 3 Commissioning of a Redundant System Setup	3-1
3.1 Requirements for commissioning	3-2
3.2 Running the initial setup of the primary CIU 888	3-3

Table of Contents

3.3	Setting up the site configuration and generating INI files	3-3
3.3.1	Supported topologies of deployment	3-3
3.3.1.1	Redundant pairs of CIU Plus and CIU Prime with a single host system	3-4
3.3.1.2	Redundant pairs of CIU Plus and CIU Prime with redundant host systems	3-5
3.3.2	Mapping of host ports	3-7
3.3.3	Setting up a site configuration for a redundant CIU 888 system setup	3-8
3.3.4	Generating INI files	3-14
3.4	Uploading the site configuration to the primary CIU 888	3-14
3.5	Configuring the additional configuration settings of the CIU 888	3-14
3.6	End commissioning of the primary CIU 888	3-15
3.7	Commissioning of the secondary CIU 888	3-15
3.8	Updating the INI files	3-17
3.9	Restarting Entis Pro and loading the updated INI files in Entis Pro	3-17
3.10	Sealing the CIU 888s	3-17
3.11	Verifying the working of the system setup	3-17
CHAPTER 4	Updating CIU 888 Site configuration	4-1
4.1	Requirements for updating the CIU 888 site configuration	4-1
4.2	Implementing the required changes in the site configuration	4-2
4.3	Regenerating the INI files	4-3
4.4	Uploading the updated site configuration to the CIU 888	4-4
4.5	Configuring the additional configuration settings	4-7
4.6	Updating the INI files	4-7
4.7	Restarting Entis Pro and reloading updated INI files in Entis Pro	4-7
4.8	Sealing the CIU 888	4-7
4.9	Verifying the working of the CIU 888 system setup	4-7
CHAPTER 5	General CIU 888 Functions	5-1
5.1	(Re)starting and shutting down the CIU 888	5-1
5.1.1	Starting the CIU 888	5-1
5.1.2	Restarting the CIU 888	5-2
5.1.3	Shutting down the CIU 888	5-2
5.2	W&M lock key switch and Configuration lock key switch	5-4
5.2.1	W&M lock key switch	5-4
5.2.1.1	Unlocking the W&M relevant configuration settings	5-4
5.2.1.2	Locking the W&M relevant configuration settings	5-5
5.2.2	Configuration lock key switch	5-6
5.2.2.1	Unlocking the configuration settings	5-6
5.2.2.2	Locking the configuration settings	5-7
5.3	Safe mode of CIU 888	5-8
5.3.1	Entering Safe mode	5-8
5.3.2	Exiting Safe mode	5-8

Table of Contents

CHAPTER 6	Advanced CIU 888 Settings	6-1
6.1	Setting the date and time of the CIU 888	6-1
APPENDIX A	Data Handling	A-1
A.1	Engineering units	A-1
A.2	Data presentation	A-1
A.2.1	Decimal and thousand separators	A-1
A.2.1.1	Decimal separator	A-1
A.2.1.2	Thousand separator	A-1
A.2.1.3	Configuring the decimal separator and thousand separator	A-1
A.2.2	Time stamped data	A-5
A.2.3	Date and time presentation	A-5
A.2.3.1	Date	A-5
A.2.3.2	Time	A-6
A.3	List of entities not needing restart after a change	A-6
APPENDIX B	Scanning	B-1
B.1	Scanning Philosophy	B-1
B.2	Configured Foreground scan items	B-1
B.3	Configured Background scan items	B-1
B.4	Command scan items	B-2
B.5	Service Messages	B-2
B.6	Priority Agent	B-2
APPENDIX C	Redundancy	C-1
C.1	Sync Link and database synchronization	C-1
C.2	Supported redundant CIU 888 topologies of deployment	C-2
C.2.1	RS-232 host port redundancy with redundant CIU 888s and host port redundancy on demand of host system	C-2
C.2.2	RS-232 host port redundancy with redundant CIU 888s and data synchronization between host systems	C-3
APPENDIX D	List of Abbreviations	D-1

Table of Contents

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CHAPTER 1 CIU 888 Configuration System overview

The CIU 888 Configuration System is used for commissioning and configuration of the CIU 888. The CIU 888 Configuration System is typically installed on a PC/laptop running Windows 7, which in turn is connected to the CIU 888 via the Service port located at the front of the CIU 888 (see FIGURE 1-1).

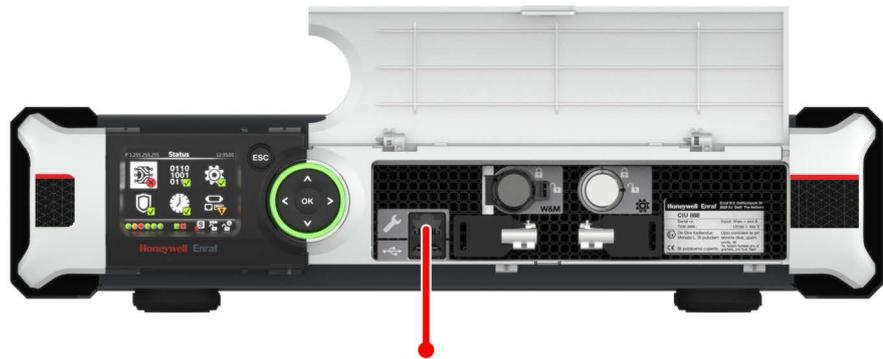


FIGURE 1-1 CIU 888: Service port

FIGURE 1-2 shows a graphic overview of the CIU 888 Configuration System and the CIU 888.

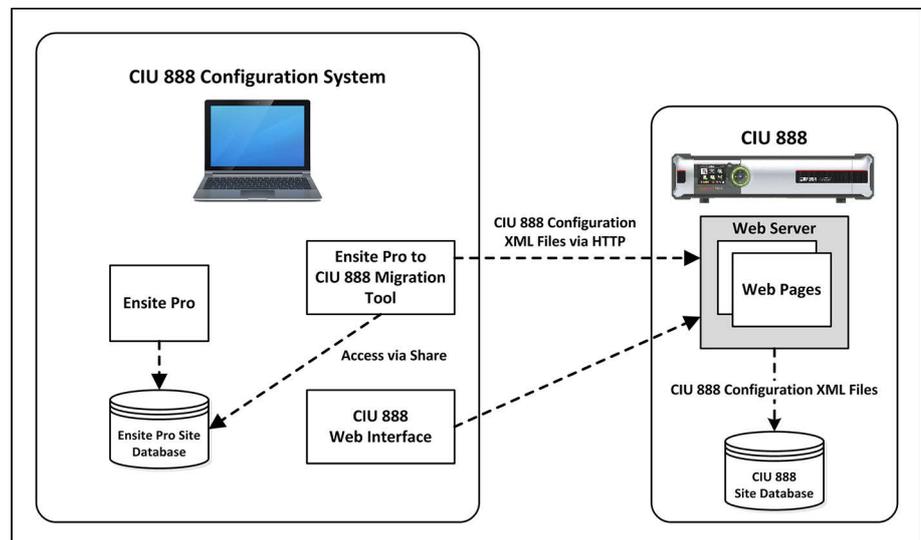


FIGURE 1-2 Graphic overview of the CIU 888 Configuration System and the CIU 888

1.1 Minimum System Requirements

The PC/laptop running the CIU 888 Configuration System must meet the following requirements:

- Windows 7 Professional, Enterprise or Ultimate edition (English), 32-bit (x86) or 64-bit (x64) version, with Service Pack 1 (SP1)
- Microsoft .NET Framework 3.5 or higher

NOTE: Microsoft .NET Framework 3.5 is installed automatically during the installation of Windows 7.

- Microsoft Internet Explorer 10.x or 11.x or Google Chrome (version 43). See also section 1.4.1.

1.2 Ensite Pro

The Ensite Pro configuration tool (version 3.0 or higher) is used to create and configure the site and data inputs (gauging instruments, tanks including tank strapping tables, and CIUs), and to configure the links between the individual site elements. FIGURE 1-3 shows the Ensite Pro tool bar and an example of a site overview.

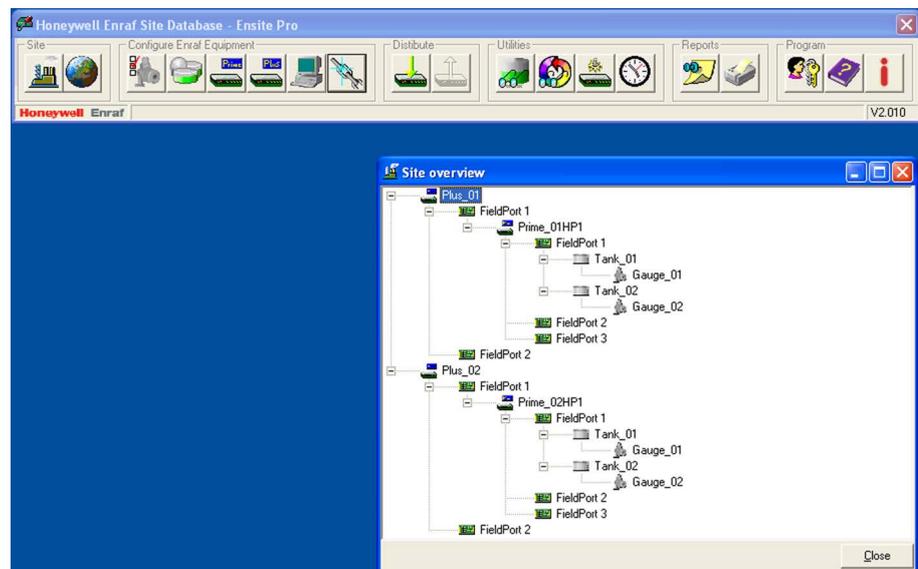


FIGURE 1-3

Ensite Pro: example of site overview

NOTE: Refer to the Instruction Manual Ensight Pro Configuration Tool version 3.0 (Part No. 4416593) for more information about using Ensight Pro.

1.2.1 Launching Ensight Pro

Perform the following steps to launch Ensight Pro:

1. Click  (Start) > All Programs > Enraf > Configuration > **Ensight Pro**.

Ensight Pro is launched. The Ensight Pro splash screen is displayed (see FIGURE 1-4) followed by the *Ensight Pro* login window (see FIGURE 1-5).



FIGURE 1-4

Ensight Pro splash screen



FIGURE 1-5

Ensight Pro login window

2. Enter the username and password to log in to Ensight Pro. Next, click **OK**.

After entering a valid username and password the Ensight Pro tool bar is displayed (see FIGURE 1-6).



FIGURE 1-6

Ensight Pro tool bar - **Select Site** button active

1.3 Ensite Pro to CIU 888 Migration tool

The Ensite Pro to CIU 888 Migration tool (see FIGURE 1-7) is used for uploading the site configuration to the CIU 888. The tool uses the site database (*.mdb file) created by Ensite Pro.

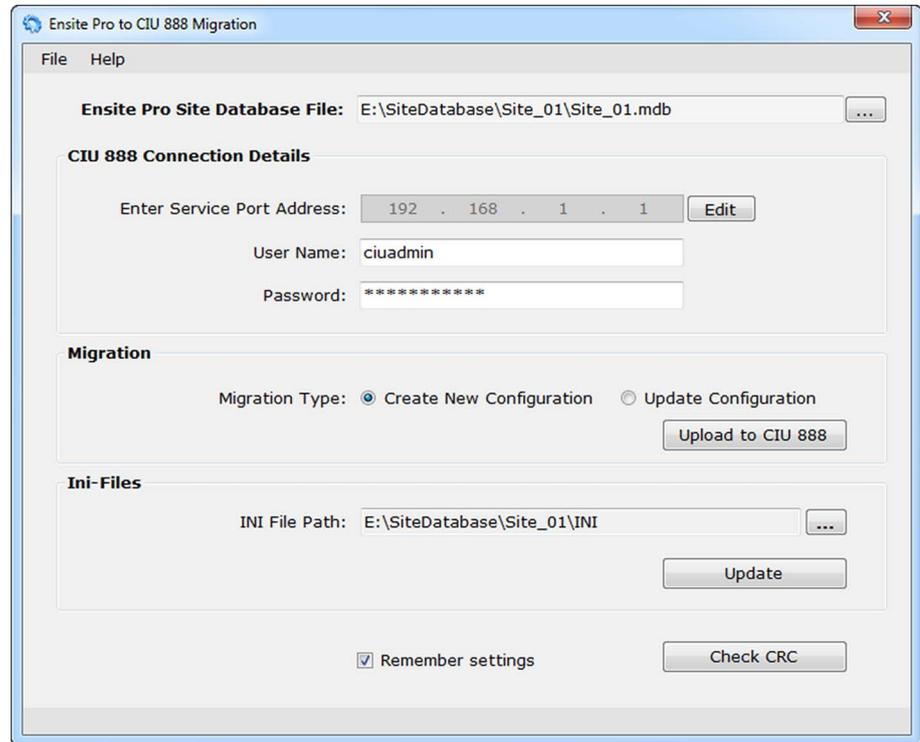


FIGURE 1-7

Ensite Pro to CIU 888 Migration tool

Furthermore, the Ensite Pro to CIU 888 Migration tool is used for updating the INI files needed for the Entis Pro tank inventory management system.

1.3.1 Launching the Ensite Pro to CIU 888 Migration tool

Before the Ensite Pro to CIU 888 Migration tool can be launched, the Migration tool files need to be copied to the PC/laptop. Subsequently, the Ensite Pro to CIU 888 Migration tool can be launched by double-clicking the **CIU8802888Migrator.exe** file.

1.4 CIU 888 Web interface

The CIU 888 Web interface provides access to functionalities such as:

- Viewing the W&M relevant and non-W&M relevant configuration settings of the CIU 888
- Configuring the additional configuration settings that cannot be configured with Ensight Pro, for example the FlexConn address for 990 type gauges
- Displaying the system status, e.g. the role of the CIU 888 in a redundant system setup, the status of the W&M lock key switch and the Configuration lock key switch
- Performing system hardware diagnostics. Users can view, for example, CIU 888 RAM usage, carrier board temperatures, last power down time including reason, et cetera
- View audit and event records logged by the CIU 888
- Installing firmware upgrades
- Updating the CIU 888 license

The CIU 888 Web interface can be accessed using a standard browser.

NOTE: In this release, only Internet Explorer 10 and 11, and Google Chrome (version 40 or later) are supported.

1.4.1 Changing the settings of Internet Explorer

To access the CIU 888 using Internet Explorer 10 or 11 or Google Chrome version 40 or later, the following changes in the browser settings need to be implemented:

1. Launch Internet Explorer.
2. Configure the self-signed SSL certificate

- a) Enter the IP address of the CIU 888 (i.e. <https://192.168.1.1>) in the address bar of the browser. Next, press the **Enter** key. The following warning is displayed (see FIGURE 1-8).

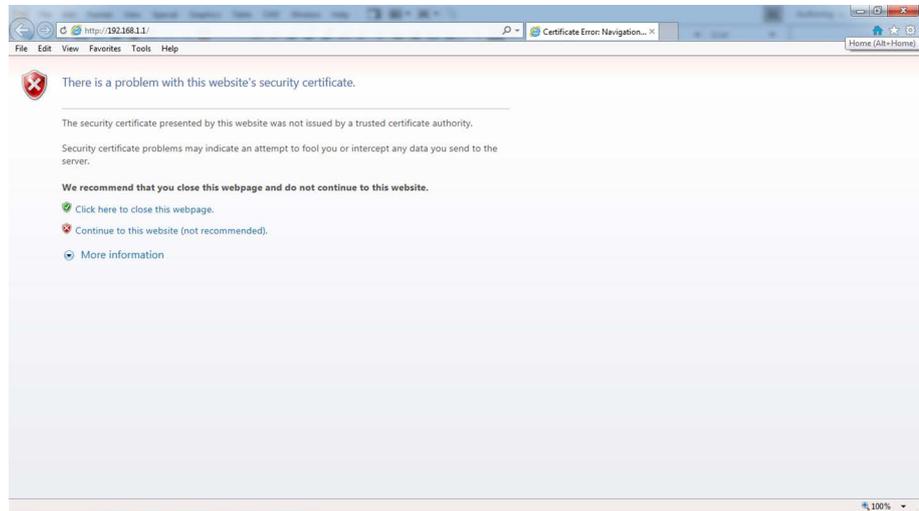


FIGURE 1-8

Website's security certificate problem

- b) Click the **Continue to this website (not recommended)** option. You will go back to Microsoft Internet Explorer.
- c) At the right of the address bar, click **Certificate Error**. The *Untrusted Certificate* pop-up window is displayed (see FIGURE 1-9).

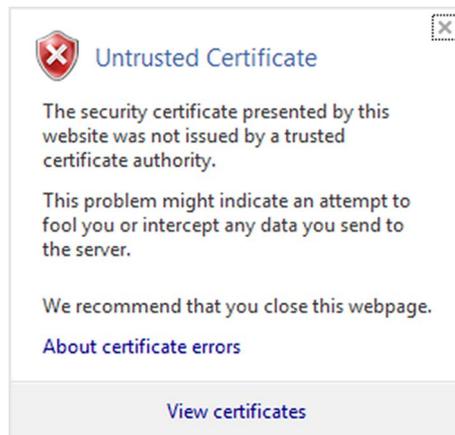


FIGURE 1-9

Untrusted Certificate pop-up window

d) Next, click **View certificates**.

The *Certificate* window is displayed. Verify the certificate details.
(see FIGURE 1-10).

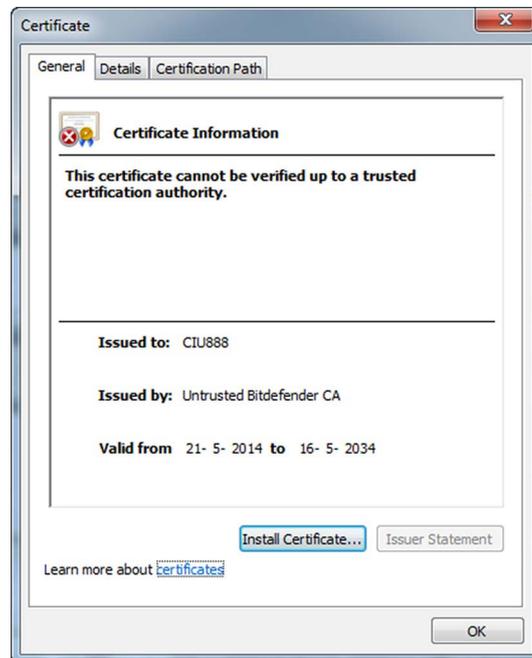


FIGURE 1-10

Certificate window

- e) Click the **Install Certificate...** button.
The *Certificate Import Wizard - Welcome* window is displayed (see FIGURE 1-11).



FIGURE 1-11

Certificate Import Wizard - Welcome window

- f) Click the **Next** button.
The *Certificate Import Wizard - Certificate Store* window is displayed (see FIGURE 1-12).

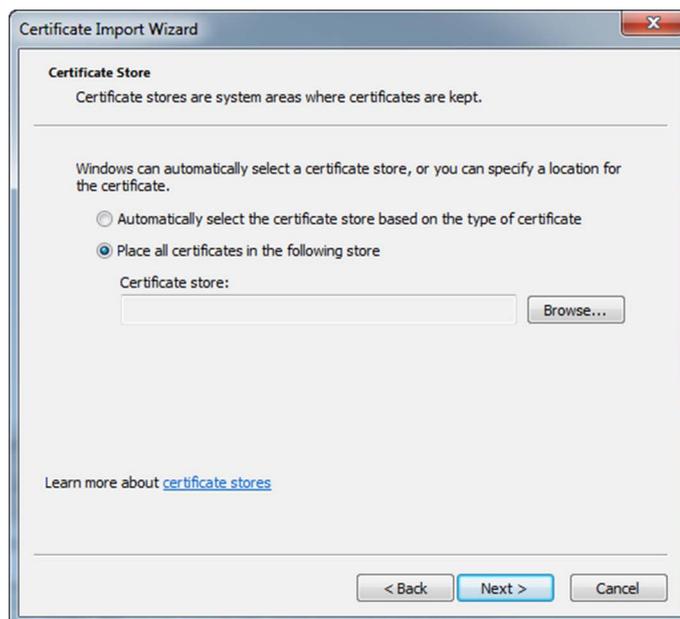


FIGURE 1-12

Certificate Import Wizard - Certificate Store window

- g) Select the **Place all certificates in the following store** radio button. Next, click the **Browse...** button. The *Select Certificate Store* window is displayed (see FIGURE 1-13).



FIGURE 1-13 *Select Certificate Store* window

- h) Select **Trusted Root Certification Authorities**. Next, click the **OK** button to save the settings and to close the window.
- i) Click the **Next** button. The *Certificate Import Wizard - Completing* window is displayed (see FIGURE 1-14).

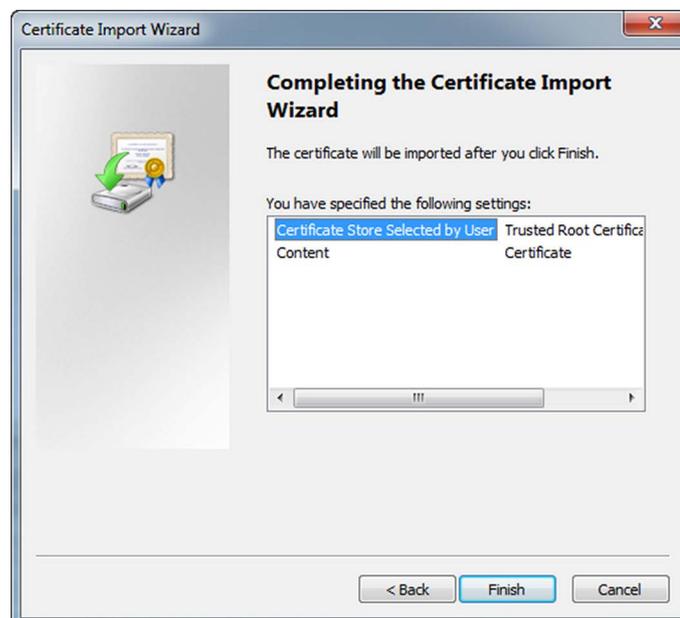


FIGURE 1-14 *Certificate Import Wizard - Completing* window

- j) Click the **Finish** button.

REMARK: If a Security Warning message is displayed (see FIGURE 1-15), click the **Yes** button and then the **OK** button.

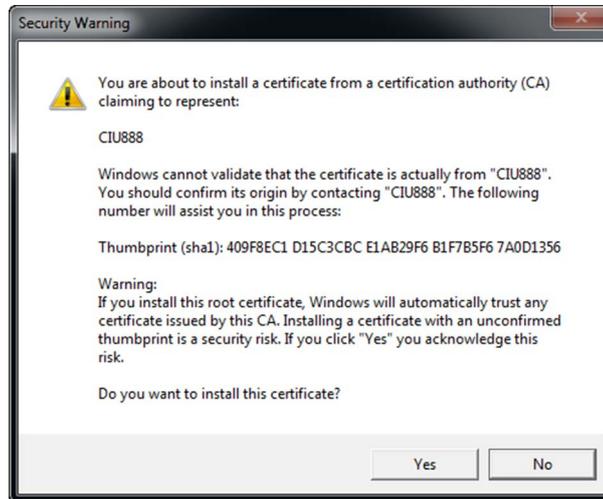


FIGURE 1-15

Security Warning message

- k) From the *Tools* menu, select the **Internet Options** option. The *Internet Options* window is displayed.

l) Go to the *Content* tab.

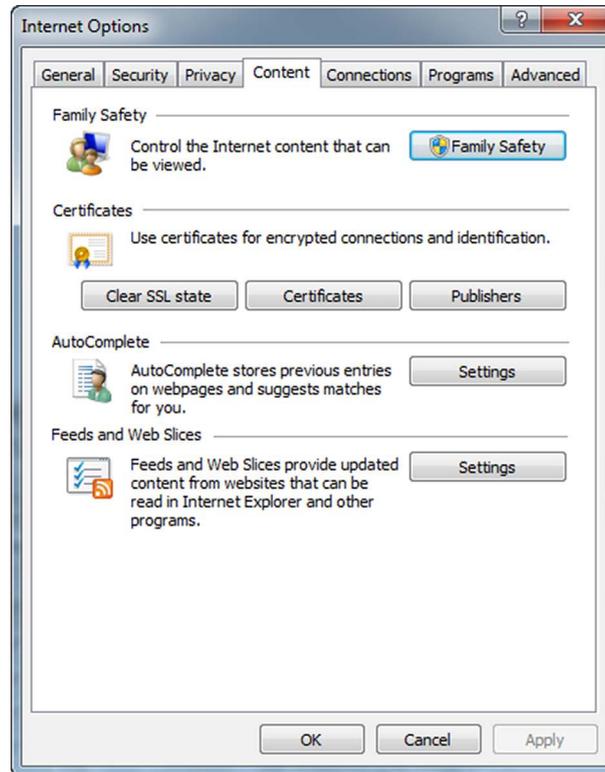


FIGURE 1-16

Internet Options window - *Content* tab

m) Click the **Certificates** button.
The *Certificates* window is displayed.(see FIGURE 1-17).

n) Go to the **Trusted Root Certification Authorities** tab.

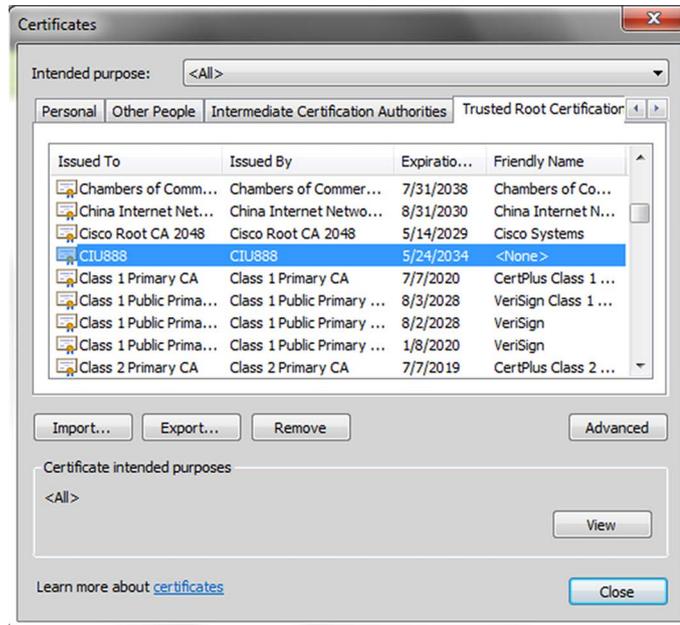


FIGURE 1-17

Certificates window - Trusted Root Certification Authorities tab

- o) Check if the CIU 888 website is listed.
- p) Click the **Close** button to close the window.
You will go back to the *Internet Options* window.
- q) Click the **OK** button to close the window.
- r) Close (all instances of) Microsoft Internet Explorer.
- s) Restart Microsoft Internet Explorer.

1.4.2 Changing the settings of Google Chrome

To access the CIU 888 using Google Chrome version 40 or later, the following changes in the browser settings need to be implemented:

1. Launch Google Chrome.
2. Configure the self-signed SSL certificate.

- a) Go to **Settings** > **Show advanced settings** > **HTTPS/SSL** and click the **Manage certificates...** button.

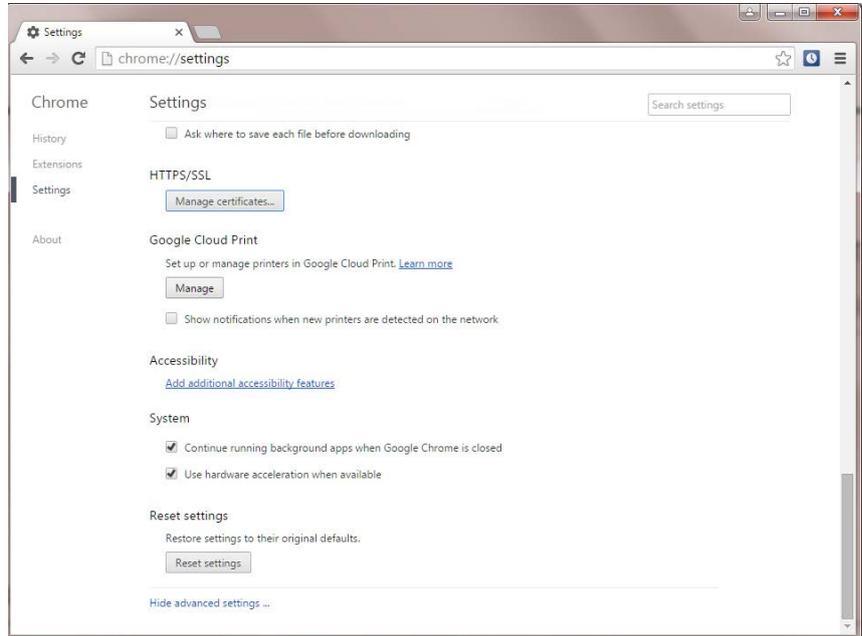


FIGURE 1-18

Navigate to the Manage certificates button on Google Chrome

- b) In the ensuing **Certificates** window, click the **Import** button to launch the Certificate Import Wizard.

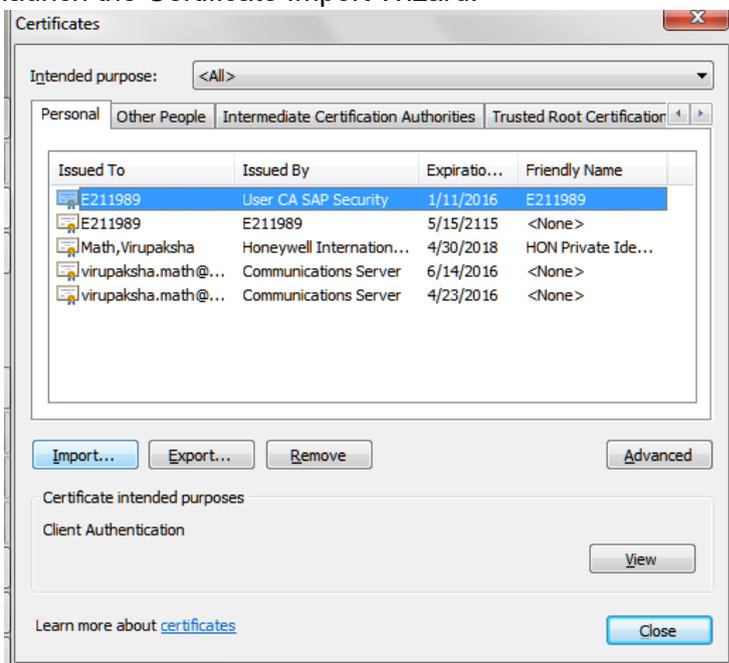


FIGURE 1-19

Certificates window: Import button

c) Click **Next** on the Welcome screen.



FIGURE 1-20

Welcome screen

d) Click the **Browse** button and select the certificate file with a .p7b extension. You must select PKCS #7 certificates option to view the certificate file with the .p7b extension.

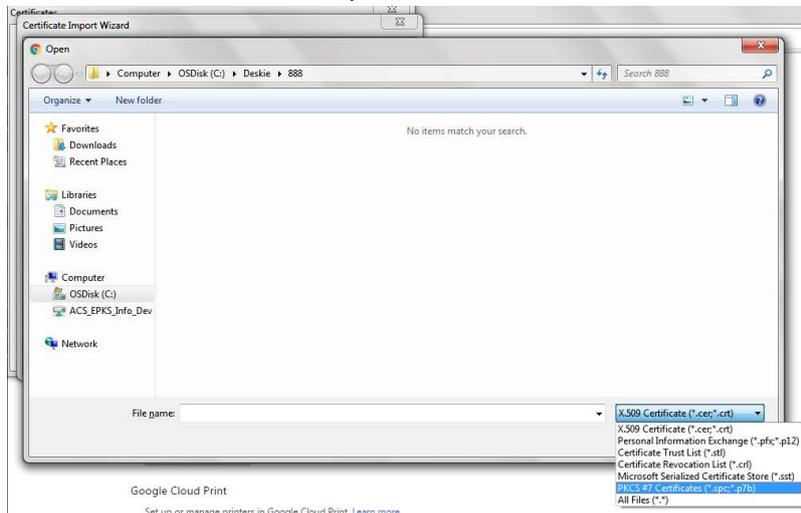


FIGURE 1-21

Browse to the certificate file

e) Click **Next**.

f) In the Certificate Store screen, select the **Place all certificates in the following store option** and click **Browse**.

g) Click the **Trusted Root Certification Authorities** folder and click **OK**.

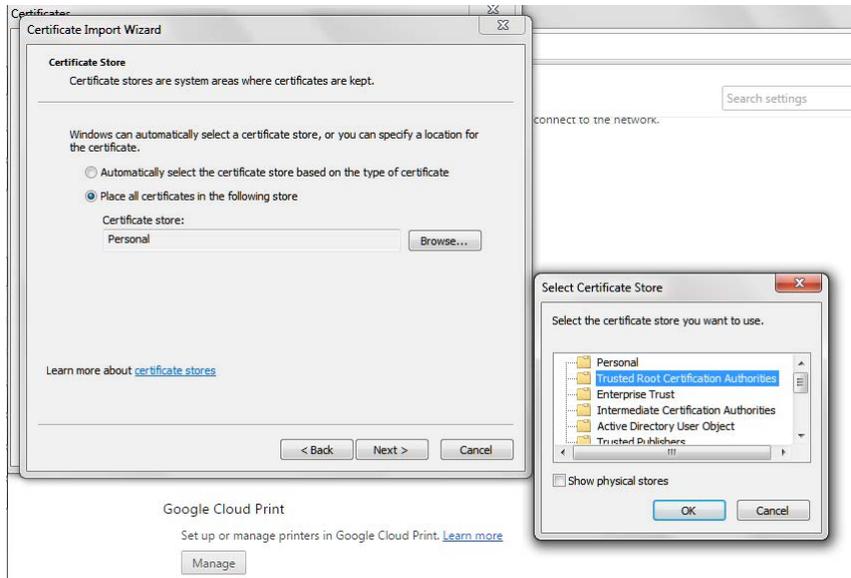


FIGURE 1-22

Select folder to save certificate file

h) Click **Next**. Details of the certificate file you are importing are displayed. Verify the details and click **Finish**.

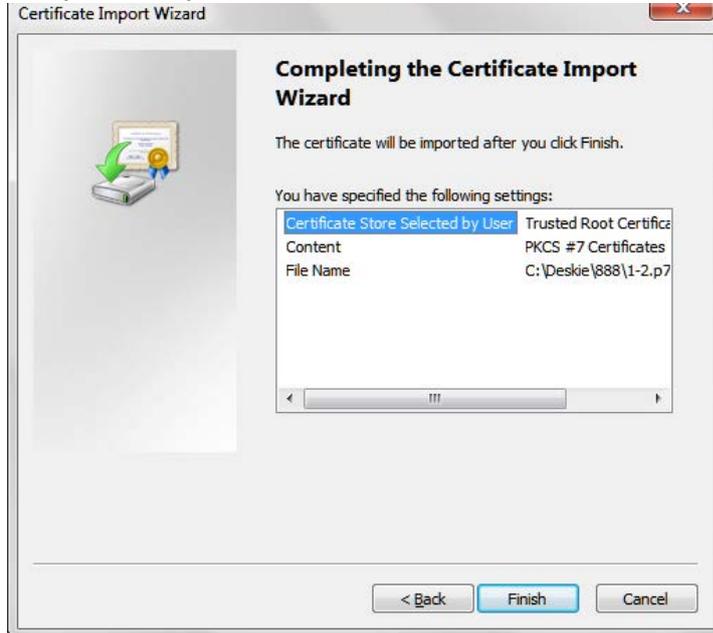


FIGURE 1-23

Verify certificate details

- i) If a warning message appears, click **Yes** and continue.

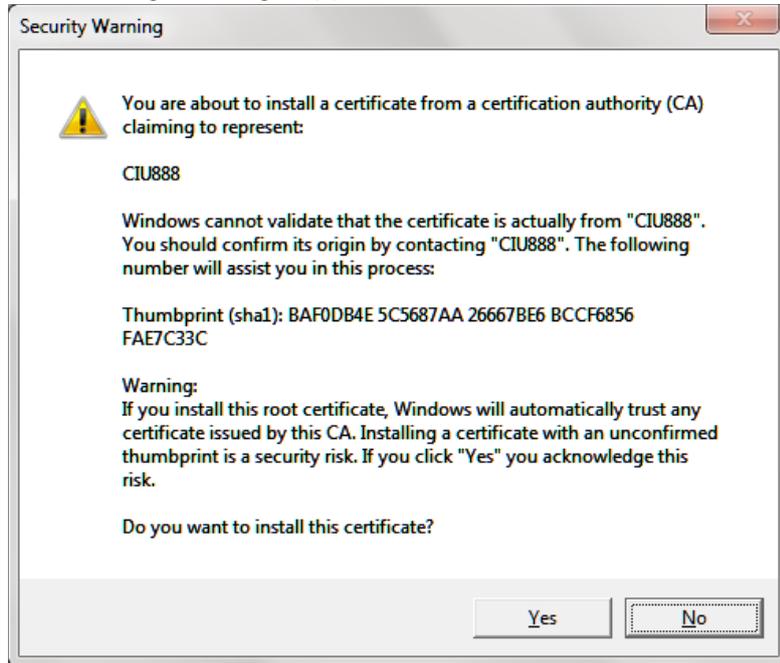


FIGURE 1-24

Warning message

- j) After the certificate is installed, a confirmation message appears. Click **OK**.



FIGURE 1-25

Confirmation message

k) Verify that the certificate CIU888 has been added by clicking the **Trusted Root Certification Authorities** tab.

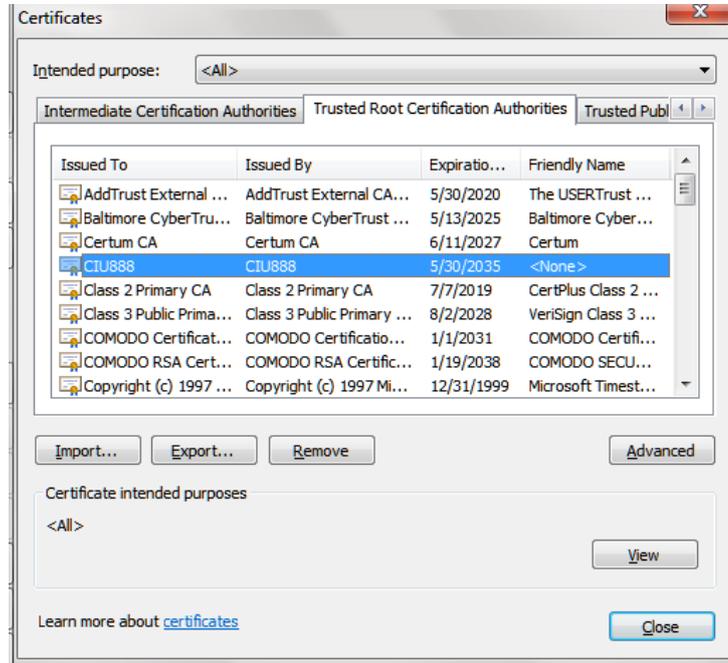


FIGURE 1-26 Verify installed certificate

1.4.3 Launching the CIU 888 Web interface

Perform the following steps to launch the CIU 888 Web interface:

1. Launch a browser.

NOTE: In this release, only Internet Explorer 10 and 11, and Google Chrome version 40 or later are supported.

2. Enter the IP address of the CIU 888 in the address bar of the browser. The IP address is: **192.168.1.1**. Next, press the **Enter** key. The *CIU 888 Login* window is displayed (see FIGURE 1-27).

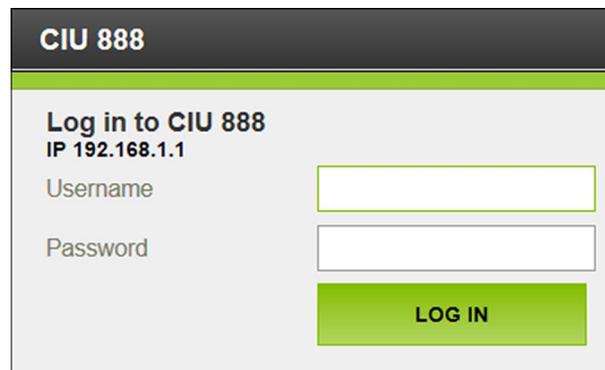


FIGURE 1-27 CIU 888 Login window

CIU 888 Configuration System overview

3. Enter the username and password to log in to the CIU 888. The username is: **ciudadmin**. Next, click **LOG IN**.

After entering a valid username and password, the CIU 888 Web interface is displayed (see FIGURE 1-28).

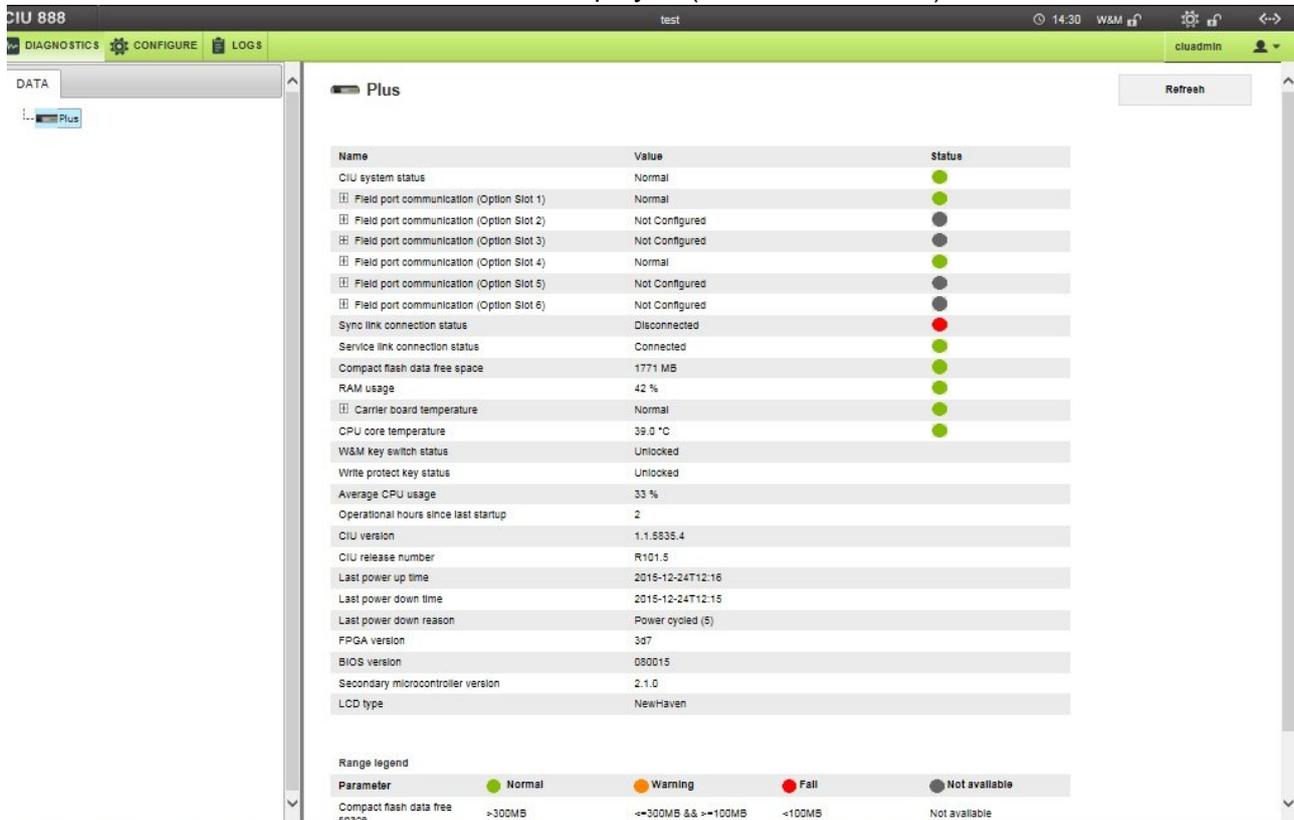


FIGURE 1-28

CIU 888 Web interface

CHAPTER 2 COMMISSIONING OF A STANDALONE SYSTEM SETUP

The procedure for the commissioning of a standalone CIU 888 system setup consists of the following steps:

1. Running the initial setup of the CIU 888, see section 2.2
2. Setting up the site configuration and generating INI files, see section 2.3
3. Uploading the site configuration to the CIU 888, see section 2.4
4. Configuring the additional configuration settings, see section 2.5
5. End commissioning of the CIU 888, see section 2.6
6. Updating the INI files, see section 4
7. Restarting the Entis Pro system connected to the CIU 888, and loading the updated INI files in Entis Pro, see section 2.8
8. Sealing the CIU 888, see section 2.9
9. Verifying the working of the system setup, see section 2.10

2.1 Requirements for commissioning

For the commissioning of a standalone CIU 888 system setup the following requirements must have been met:

- The electrical and mechanical installation of the CIU 888 must be completed. Refer to the *Installation Manual CIU 888* (Part No. 4417590) for more information.
- The CIU 888 must be switched on, see section 5.1.1
- Both the W&M lock key switch and the Configuration lock key switch must be in 'unlocked' position, see section 5.2
- A PC/laptop running the CIU 888 Configuration System must be connected to the Service port of the CIU 888 using a Cat. 5 Ethernet cable (patch or crossover). The Service port is located at the front of the CIU 888 (see FIGURE 2-1). See Chapter 1 for more information about the CIU 888 Configuration System.



FIGURE 2-1

CIU 888: Service port

- During commissioning of the CIU 888, the Entis Pro system connected to the CIU 888 must be shut down.

2.2 Running the initial setup of the CIU 888

The first step in the procedure for the commissioning of a standalone CIU 888 system setup is running the initial setup.

2.2.1 Logging on to the CIU 888 and changing the initial password

During the initial setup, a user has to log on to the CIU 888 and change the initial password first.

Procedure:

1. On the PC/laptop connected to the CIU 888, launch a browser.

NOTE: In this release, only Internet Explorer 10 and 11, and Google Chrome (version 40 or later) are supported.

2. Enter the IP address of the CIU 888 in the address bar of the browser. The IP address is: **192.168.1.1**. Next, press the **Enter** key. The *Login* window of the CIU 888 is displayed.

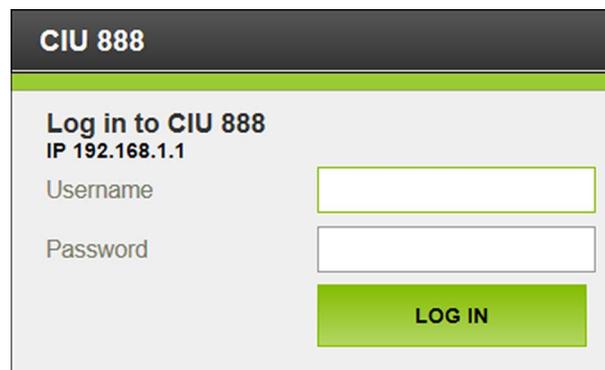
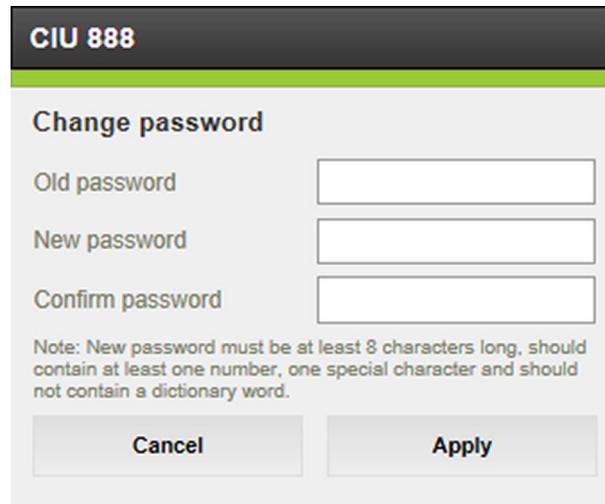


FIGURE 2-2

CIU 888: *Login* window

3. Enter the username and password to log in to the CIU 888. The username is: **ciuadmin**. The initial password is **CIU888@Enraf**. Next, click **LOG IN**.
After entering a valid username and password, the CIU 888 prompts

the user to change the password of the ciuadmin account (see FIGURE 2-3).



CIU 888

Change password

Old password

New password

Confirm password

Note: New password must be at least 8 characters long, should contain at least one number, one special character and should not contain a dictionary word.

Cancel **Apply**

FIGURE 2-3

CIU 888: *Change Password* window

NOTE: *Changing the password is only required during the initial setup of the CIU 888.*

4. Change the password of the ciuadmin account.
 - a) Enter the current password in the *Old Password* text box.
 - b) Enter the new password in the *New Password* text box and in the *Confirm Password* text box.

The password must meet the following criteria:

 - It must not be the same as the previous password
 - It must not contain any dictionary words (e.g. password)
 - It must be at least eight characters long
 - It must contain at least one number and one special character
 - It must not contain special characters !, ' and ”

Commissioning of a Standalone System Setup

c) Click **Apply**.

The CIU 888 Web interface is displayed. The *Diagnostics* window is displayed by default (see FIGURE 2-4).

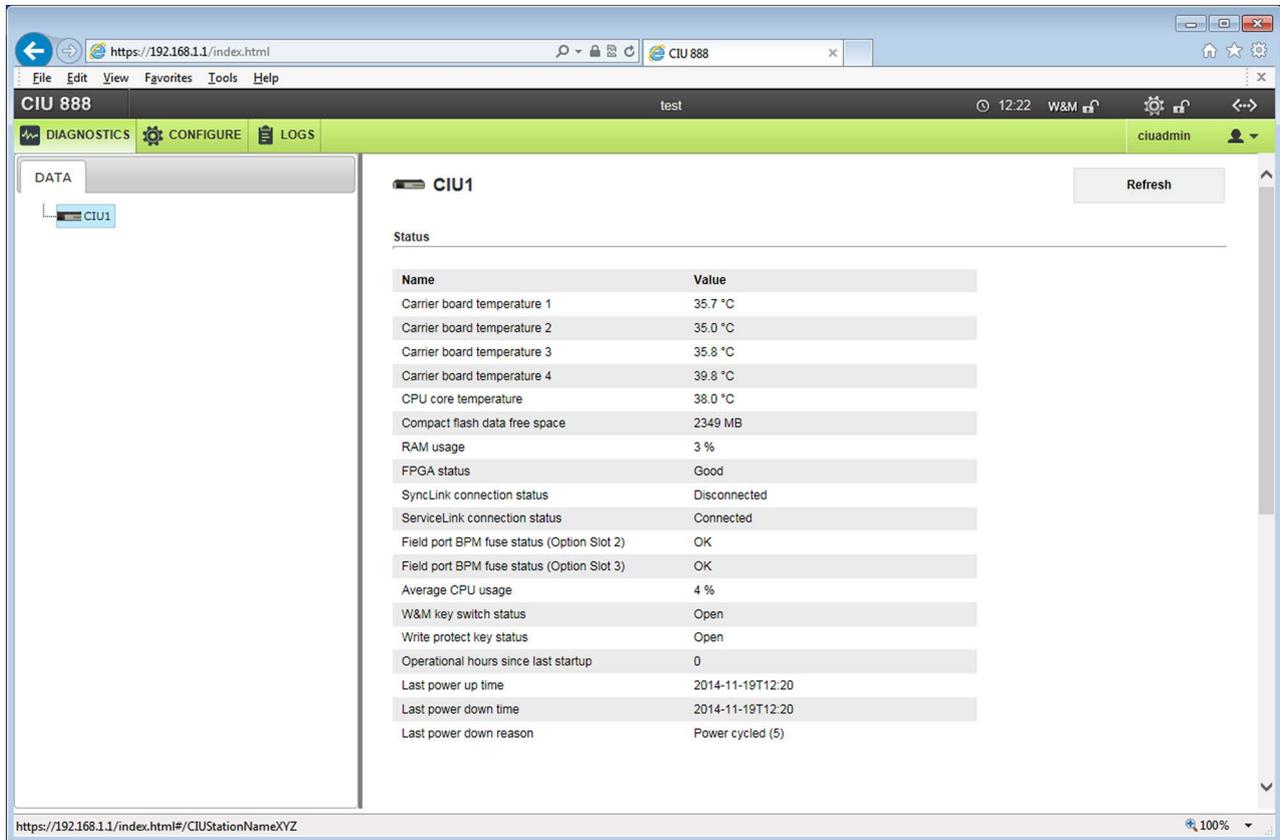


FIGURE 2-4

CIU 888 Web interface: *Diagnostics* window

2.2.2 Verifying the CIU 888 license

When the initial password has been changed, the next step is to verify if a license is installed on the CIU 888 and if the license installed supports the functionality ordered by the customer.

NOTE: Refer to the Firmware Upgrade Manual (Part No. 4417596) for more information about the CIU 888 license.

Commissioning of a Standalone System Setup

Procedure:

1. In the CIU 888 Web interface, click **CONFIGURE** in the section menu bar.
The *Configure* window is displayed (see FIGURE 2-5).

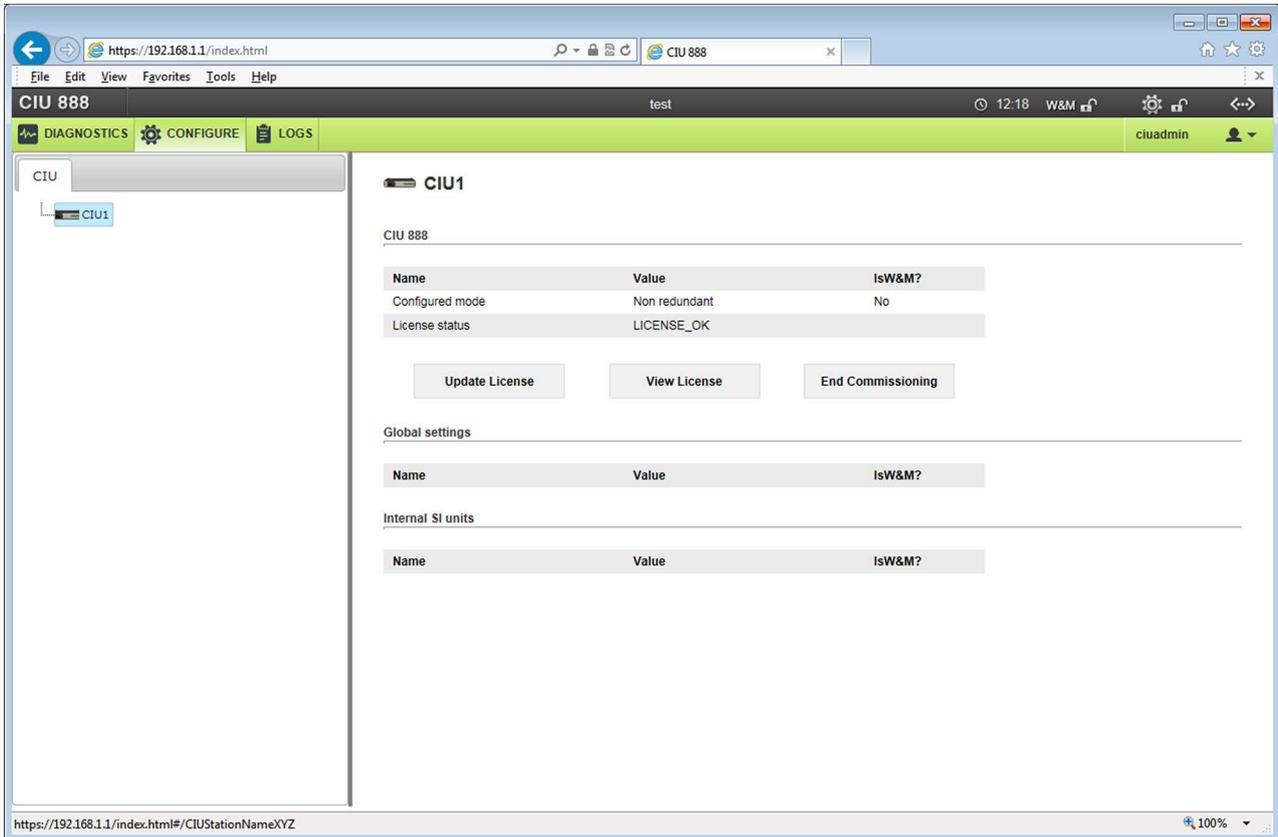
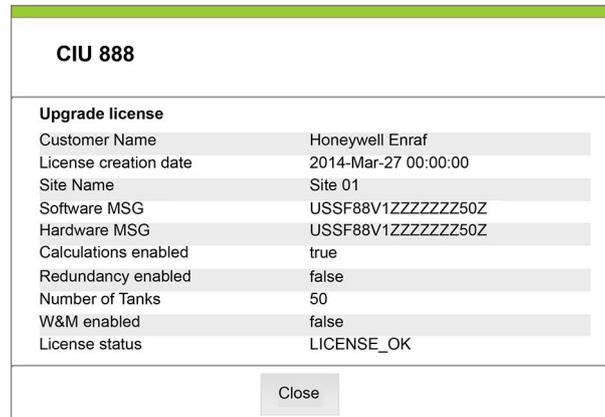


FIGURE 2-5

CIU 888 Web interface: *Configure* window

2. If a license is installed on the CIU 888, 'LICENSE_OK' is displayed in the *License status* field. If no license is installed, the field is empty. In this case, contact Honeywell Enraf.

3. Click **View License** to view the details of the license currently installed on the CIU 888.
The *View License* window is displayed (see FIGURE 2-6).



CIU 888	
Upgrade license	
Customer Name	Honeywell Enraf
License creation date	2014-Mar-27 00:00:00
Site Name	Site 01
Software MSG	USSF88V1ZZZZZZ50Z
Hardware MSG	USSF88V1ZZZZZZ50Z
Calculations enabled	true
Redundancy enabled	false
Number of Tanks	50
W&M enabled	false
License status	LICENSE_OK

FIGURE 2-6

CIU 888 Web interface: *View License* window

4. Verify if the correct license is installed on the CIU 888. If this is not the case, contact Honeywell Enraf.

2.3 Setting up the site configuration and generating INI files

When the initial setup of the CIU 888 is completed, the next step is to set up the site configuration using Ensite Pro. The site configuration can be set up either by:

- Creating a new site configuration
- or
- Copying an existing CIU 880 site configuration and implementing the required changes so that the site configuration meets one of the supported topologies of deployment. The supported topologies are described in section 2.3.1.

2.3.1 Supported topologies of deployment

In case of setting up a site configuration for a CIU 888 in a standalone system setup, the following topologies of deployment are supported:

- Single CIU Prime connected to a host system (see section 2.3.1.1)
- Single pair of CIU Plus and CIU Prime connected to a host system (see section 2.3.1.2)

REMARK: If an existing CIU 880 site configuration needs to be migrated, it should also be in one of the supported configurations listed above before using the site configuration in the CIU 888. If the existing site configuration is not in one of these configurations (e.g. a single CIU Plus two CIU Primes or multiple CIU Pluses and/or CIU Primes configured in the same site database), the site

configuration needs to be manually edited to match one of these configurations. Another option could be to create a copy of the existing site configuration and then delete the site elements not required to be imported. It is, of course, necessary that the mechanical and electrical installation is also adjusted so it will match the changed site configuration.

2.3.1.1 Single CIU Prime

In this topology, a single CIU Prime is connected to a host system (i.e. DCS, PLC or SCADA system) via one of its two host ports (see FIGURE 2-7). A configured host port has its own unique RTU address and enables Modbus RTU on serial communication.

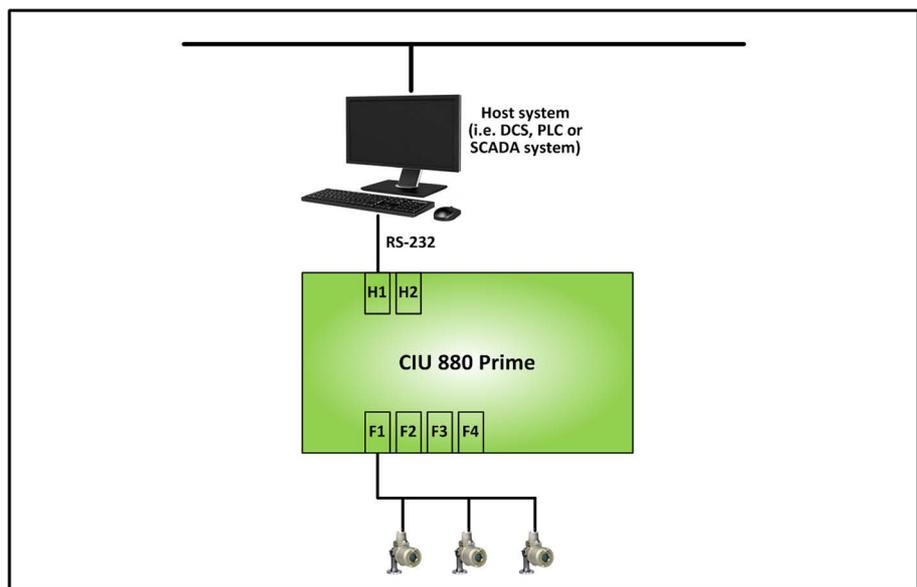


FIGURE 2-7

Schematic representation of a site with a single CIU Prime

A maximum of four field ports are available to connect to gauging instruments. The field ports can be configured for GPU on Bi-Phase Mark communication or GPU on serial communication.

NOTE: A single CIU Prime cannot be connected to an Entis Pro host system.

2.3.1.2 Single pair of CIU Plus and CIU Prime

In this topology, a single pair of CIU Prime and CIU Plus is connected to a host system (i.e. Entis Pro) via one of the four host ports of the CIU Plus (see FIGURE 2-8). A configured host port has its own unique RTU address and enables Modbus on serial communication.

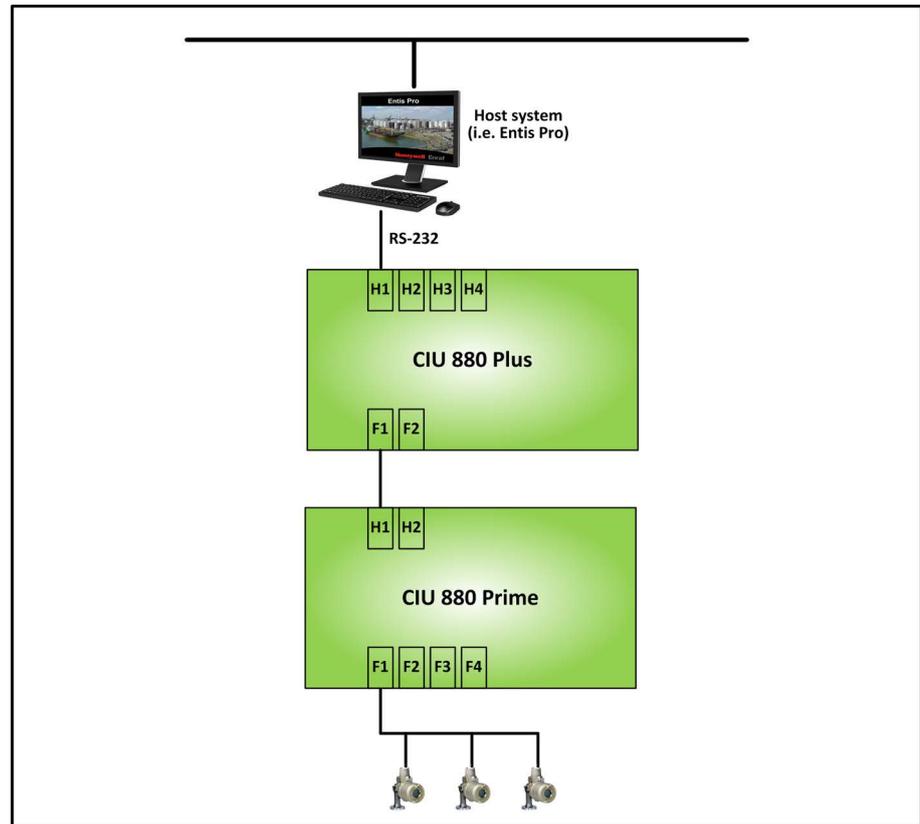


FIGURE 2-8

Schematic representation of a site with a single pair of CIU Plus and CIU Prime

On the CIU Prime, a maximum of four field ports are available to connect to tank gauging instruments. The field ports can be configured for GPU on Bi-Phase Mark communication or GPU on serial communication.

The CIU Prime and the CIU Plus are connected to one another via one of the host ports of the CIU Prime and one of the field ports of the CIU Plus.

2.3.2 Mapping of host ports

Entis Pro allows users to configure the four CIU Plus host ports and the two CIU Prime host ports, whereas the CIU 888 features two fixed host ports and two flexible host ports (i.e. option slots 5 and 6 can be configured as host port).

Commissioning of a Standalone System Setup

FIGURE 2-9 shows an example of how the CIU Plus/CIU Prime host ports are mapped to the CIU 888 host ports in the site configuration.

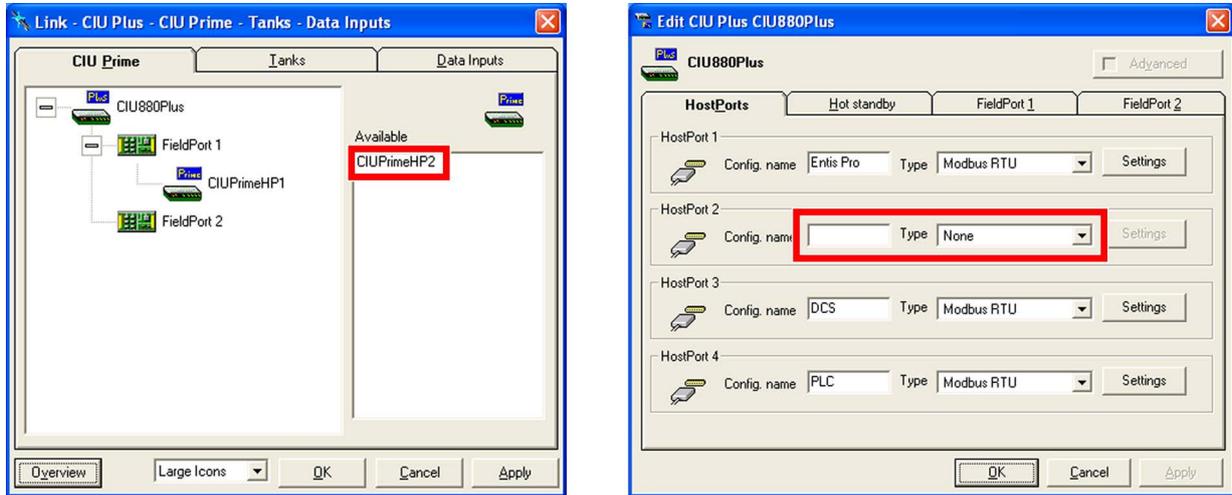


FIGURE 2-9

Mapping of CIU Prime/CIU Plus host ports to CIU 888 host ports

- CIU Prime host port 1 is ignored
- CIU Prime host port 2 is mapped to CIU 888 fixed host port 2
- CIU Plus host port 1 is mapped to CIU 888 fixed host port 1
- CIU Plus host port 3 is mapped to CIU 888 optional slot 5
- CIU Plus host port 4 is mapped to CIU 888 optional slot 6

CIU emulation (compatible with the CIU 858) can be configured for any of the CIU 888 host ports. For example: If CIU 888 fixed host port 2 must be enabled for CIU emulation, then in the site configuration CIU Plus host port 2 must be left unconfigured (as shown in FIGURE 2-

9). CIU emulation can be configured via CIU Prime host port 2 (see FIGURE 2-10).

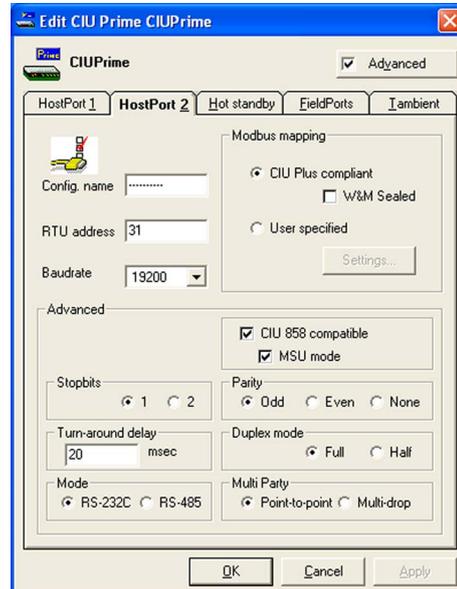


FIGURE 2-10

Ensight Pro: *Edit CIU Prime* window - CIU emulation enabled

NOTE: Refer to the *Protocol Manual - CIU Emulation (Part No. 4417589)* for more information about CIU Emulation.

2.3.3 Configuration procedure in Ensight Pro

The complete configuration procedure in Ensight Pro consists of the following steps:

NOTE: For more details, refer to the *Instruction manual Ensight Pro Configuration Tool version 3.0 (Part No. 4416593)*.

1. Preparation

Before starting with creating and configuring the site, a number of details must be known, e.g. site layout, information about field cabling, tag names of site elements (i.e. gauges, tanks and CIUs), tank information (tank strapping tables or tank capacity tables, roof details, etc.), information on types of stored product, host communication setup (if applicable).

2. Creating the site and defining the global settings

The creation of the site allows Ensight Pro to store a configuration set with a database. The global settings are required for initiating the configuration database. When the global settings have been defined, Ensight Pro will create a site database.

3. Retrieving the configuration settings of the tank gauges

4. Creating and configuring the tanks
Tank strapping tables or tank capacity tables can be linked via an external file.
5. Creating and configuring the CIU Prime(s)
In the CIU Prime, the following parts can be configured:
 - Host port 1
 - Host port 2
 - Hot standby (required if redundant CIU Primes are installed)
 - Field ports 1 through 4
6. Creating and configuring the CIU Plus(es)
In the CIU Plus, the following parts can be configured:
 - Host ports 1 through 4 (required to make the CIU Plus compatible with the connected hardware and software, i.e. Entis Pro, PLC or DCS)
 - Hot standby (required if redundant CIU Primes and/or CIU CIU Pluses are installed)
 - Field port 1
 - Field port 2
7. Linking of the data inputs, tanks and CIUs

The site configuration created with Ensite Pro is saved as a Microsoft Access Database file (*.mdb file) in the folder **'[Drive:]\Users\Public\Documents\Enraf\Ensite Pro\SiteDatabase\SiteName'** (see FIGURE 2-11).

This folder also contains the following sub-folders:

- INI
This folder is reserved for Entis Pro INI files generated with Ensite Pro.
- LOG
This folder is reserved for log files.
- STR
This folder is reserved for strapping table files linked to the tanks in the site configuration.

2.3.4 Generating INI files

When the site configuration has been set up according to one of the supported topologies of deployment, the next step is to generate the INI files needed for Entis Pro.

Refer to the *Instruction manual Ensate Pro Configuration Tool version 3.0* (Part No. 4416593) for detailed information about generating INI files using Ensate Pro.

2.4 Uploading the site configuration to the CIU 888

When the site configuration has been set up and the INI files have been generated, the next step is to upload the site configuration to the CIU 888 using the Ensate Pro to CIU 888 Migration tool.

1. Launch the Ensate Pro to CIU 888 Migration tool.
The Ensate Pro to CIU 888 Migration tool is launched.

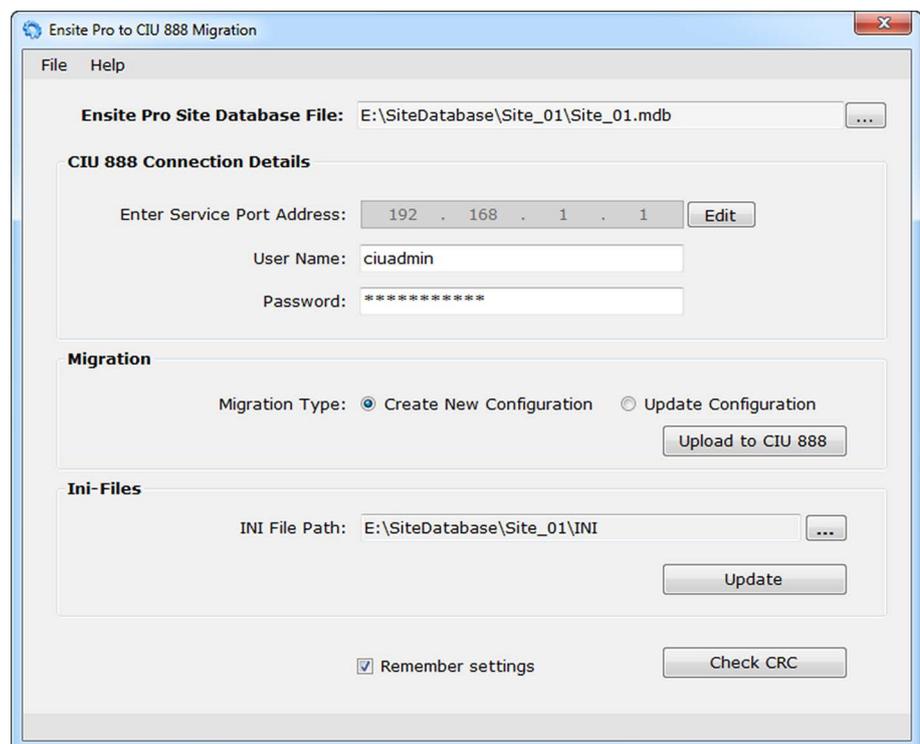


FIGURE 2-11

Ensate Pro to CIU 888 Migration tool

2. Enter the following information:
 - **Ensate Pro Site Database File**
Select the Ensate Pro site database file (*.mdb file). Click  (**Browse**) to browse to the appropriate folder and select the *.mdb file.
After selecting the Ensate Pro site database file, the file name including the full path is displayed.

Commissioning of a Standalone System Setup

- **Enter Service Port Address**
The IP address 192.168.1.1 is displayed. Leave this address unchanged.
- **User Name**
Enter the user name, i.e. ciuadmin.
- **Password**
Enter the password of the ciuadmin user account.
- **Migration Type**
Select the **Create New Configuration** option.

NOTE: The difference between the **Create New Configuration** option and the **Update Configuration** option is described in Table 2-1:

TABLE 2-1 Difference between *Create New Configuration* option and *Update Configuration* option

Create New Configuration:	Deletes the existing site configuration completely (if already uploaded) and uploads the new site configuration to the CIU 888. The Create New Configuration operation can only be performed after a Reset to Factory Defaults operation via the CIU 888 display has been performed or after the CIU 888 has been dispatched from the factory.
Update Configuration	Uploads the implemented changes to the site configuration that is already uploaded to the CIU 888. An Update Configuration operation is allowed only on a commissioned CIU 888.

- **INI File Path**
When the Ensite Pro site database file has been selected, the path to the folder where the INI files will be stored is automatically selected. If necessary, you can change the folder by clicking (**Browse**) to browse to the appropriate folder.
 - **Remember settings**
Select the check box if the current settings must be saved.
3. Click **Upload to CIU 888**.
The following dialogue box is displayed (see FIGURE 2-12).

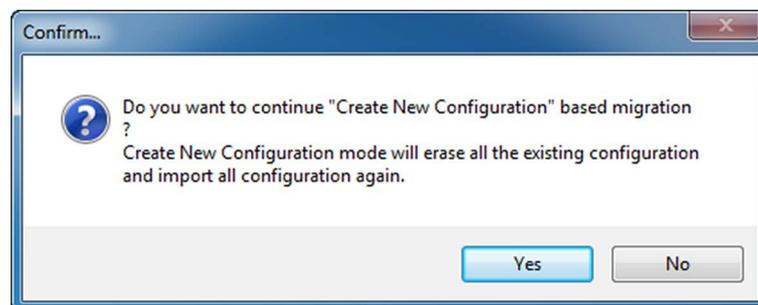


FIGURE 2-12 *Successfully Migrated* dialogue box

4. Click **Yes**.

The dialogue box is closed. If the site configuration is successfully uploaded to the CIU 888, the following dialogue box is displayed (see FIGURE 2-13).

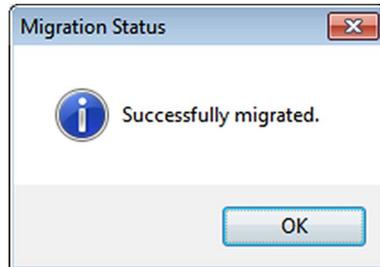


FIGURE 2-13

Successfully Migrated dialogue box

5. Click **OK** to close the dialogue box.

6. Leave the Ensite Pro to CIU 888 Migration tool open since it will be needed for updating the INI files.

2.5 Configuring the additional configuration settings of the CIU 888

When the Ensite Pro site configuration has been uploaded to the CIU 888, the next step is to configure the additional configuration settings of the CIU 888.

1. Launch the CIU 888 Web interface, see section 1.4.2.

Commissioning of a Standalone System Setup

- Click **CONFIGURE** in the section menu bar.
The *Configuration* window is displayed (see FIGURE 2-14).

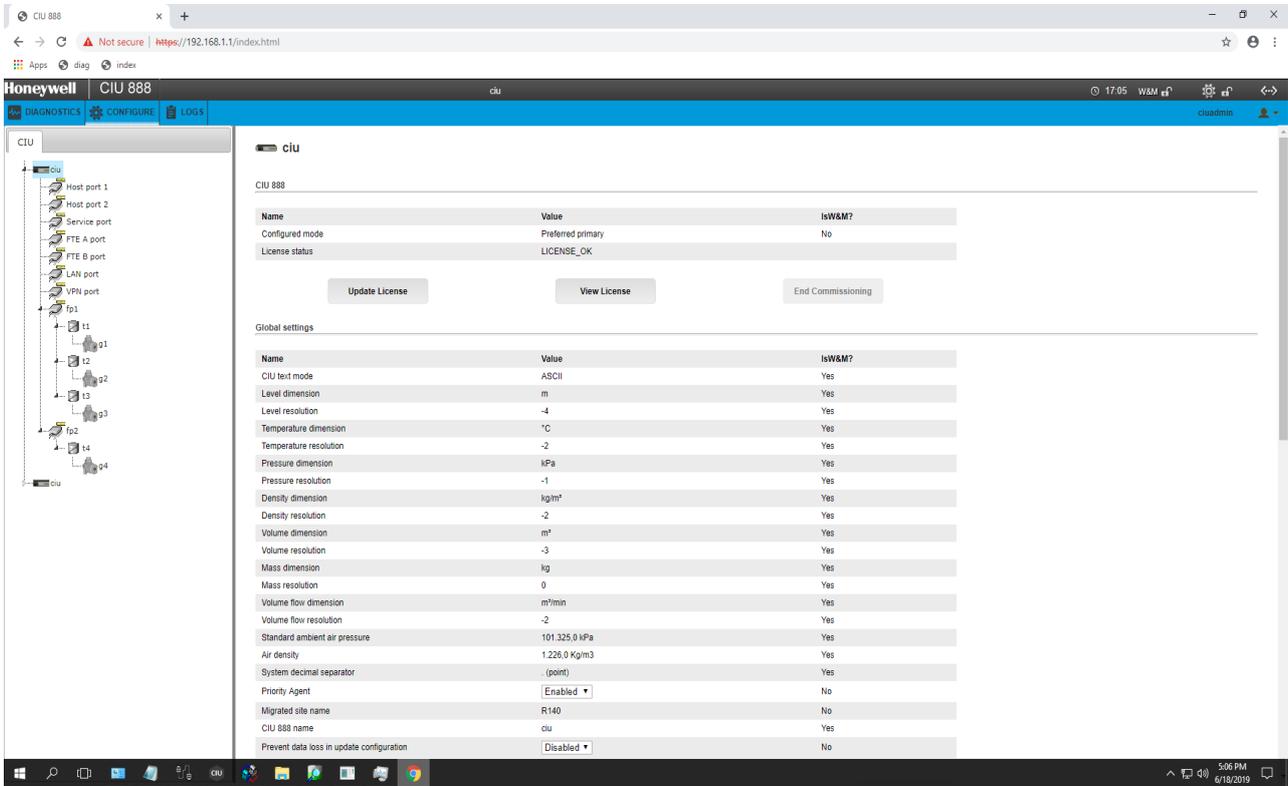


FIGURE 2-14

CIU 888 Web interface: *Configuration* window: FlexConn address setting

Commissioning of a Standalone System Setup

3. Configure the additional configuration settings.

Site Element Type	Parameter Name	Description	Value Range	Default Value
CIU	Priority Agent	<p>Indicates whether Priority Agent is enabled or disabled.</p> <p>Priority Agent is disabled - CIU 888 scans the field using a static time based scanning algorithm for foreground and background scan items. No priority changes happen based on Product movement and Tank High Monitoring Limit.</p> <p>Priority Agent is enabled - CIU 888 scans the field using a dynamic time scanning algorithm based on the Product movement and Tank High limit. Relative scan priorities are done between static tanks (tanks with no product movement), dynamic tanks (tanks with product movement), dynamic tanks in which product level is beyond the configured Tank high monitoring limit, Tanks with field device communication errors.</p> <p>See Chapter B section B.6 for Priority Details.</p>	Enabled Disabled	Enabled
HostPort	TRDT Suppress Moving Status	<p>Indicates whether Moving status is suppressed or not in the CIU888's Modbus Tank record.</p> <p>Enabled - Moving status suppressed Disabled - Moving status suppressed</p>	Enabled Disabled	Disabled
Tank	HighLevelMonitoringLimit (%)	Indicates the configured % of Tank capacity. CIU 888 scans product level with a higher frequency if Product level crosses the configured % of Tank capacity.	double value	90
Flexcon	Flexcon	Flexcon address of the gauge.	0-1899	0
GPU Cache	GPU Cache	For emulation requests, will this data be received from cache or directly from the field.	Enabled Disabled	Enabled
VPN Port	IP Address	IP address of VPN port	Valid IP address	192.168.5.1
VPN Port	IP Address	IP address of partners VPN port in case of redundant configuration. This field is not used in case of non redundant configuration.	Valid IP address	192.168.5.2
VPN Port	Subnet Mask	Input valid subnet for VPN port	Valid Subnet	255.255.255.0

4. Click **Update** to update the additional configuration settings.

2.5.1 954 Servo gauge integration with Entis Pro

The following steps are recommended when configuring 954 Servo gauge in CIU 888 and data needs to be provided to the Entis Pro inventory system.

1. Select the “Gauge type” as 854 in the Entis Pro configuration and configure other gauge settings as required.
2. Upload the configuration to CIU 888. Refer to *section 2.4, “Uploading the site configuration to the CIU 888”* for the procedure.
3. Launch the CIU 888 Web interface, (see section 1.4.2).
4. From the section menu bar, click **CONFIGURE**.

The Configure window is displayed (see section 2-15).

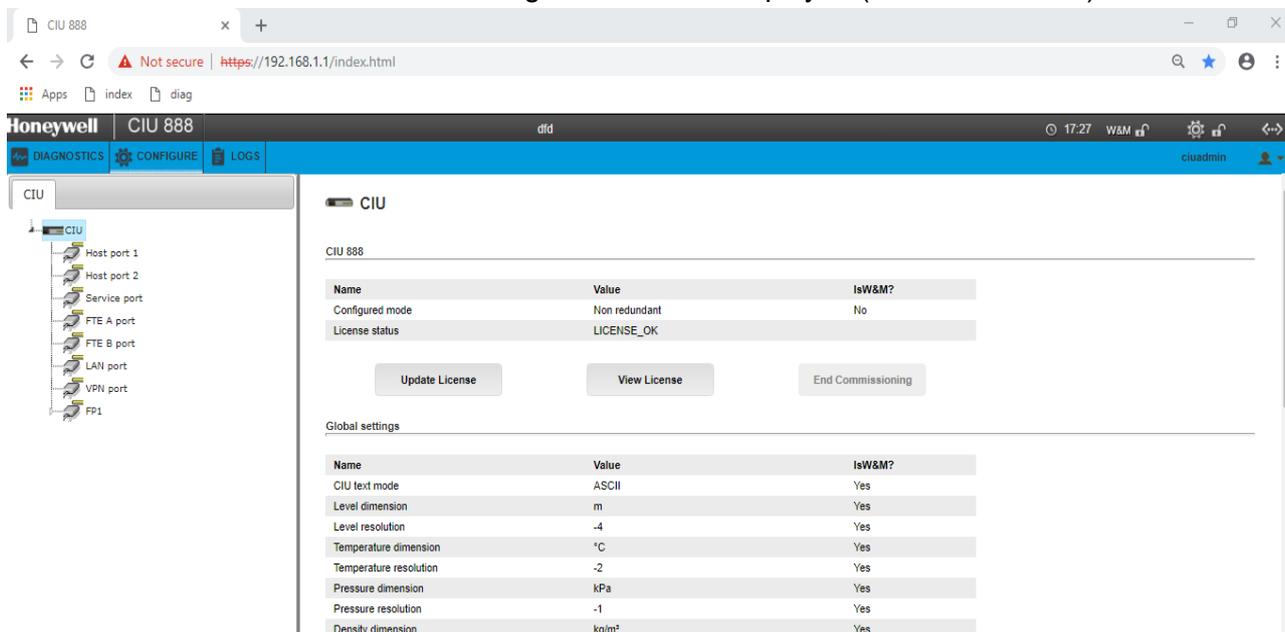


FIGURE 2-15

CIU 888 Web interface: *Configuration* window

Commissioning of a Standalone System Setup

- Click the required gauge in the “siteelement tree”. Gauge configuration appears in the right pane.

The screenshot shows the Honeywell CIU 888 configuration interface. The left pane displays the 'CIU' site element tree with 'G1' selected. The right pane shows the 'Gauge' configuration table for 'G1'.

Name	Value	IsW&M?
Gauge Type	854	Yes
Allowed gauge commands	799	No
Element type	No element available	Yes
Lowest element position	0.000,0 m	Yes
Product level address	11	Yes
Product level TOI	B	Yes
Product level TOR	B	Yes
Product level dimension	m	Yes
Product level resolution	-4	No
Product level fore/background scan	Foreground	Yes
Product temperature address	11	Yes
Product temperature TOI	B	Yes
Product temperature TOR	C	Yes
Product temperature dimension	°C	Yes
Product temperature resolution	-2	No
Product temperature fore/background scan	Background	Yes
Vapour pressure address	FFF	Yes

- Select the “Gauge type” as **954** and set the “Flexconn Address” to the required value.

The screenshot shows the Honeywell CIU 888 configuration interface. The left pane displays the 'CIU' site element tree with 'G1' selected. The right pane shows the 'Gauge' configuration table for 'G1' with a dropdown menu open for 'Gauge Type'.

Name	Value	IsW&M?
Gauge Type	954	Yes
Allowed gauge commands	Unknown	No
Element type	811	No element available
Lowest element position	854	Yes
Product level address	866	Yes
Product level TOI	872	Yes
Product level TOR	873	Yes
Product level dimension	877	Yes
Product level resolution	884	No
Product level fore/background scan	954	Yes
Product temperature address	970	Yes
Product temperature TOI	971	Yes
Product temperature TOR	973	Yes
Product temperature dimension	990	Yes

Commissioning of a Standalone System Setup

Parameter	Value	IsW&M?
Density in fore/background scan	Background	Yes
Vapour temperature address	FFF	Yes
Vapour temperature TOI	B	Yes
Vapour temperature TOR	ZAG	Yes
Vapour temperature dimension	°C	Yes
Vapour temperature resolution	-2	No
Vapour temperature in fore/background scan	Background	Yes
Data input name	G1	Yes
Ambient temperature address	FFF	Yes
Ambient temperature TOI	B	Yes
Ambient temperature TOR	ZAG	Yes
Ambient temperature dimension	°C	Yes
Ambient temperature resolution	-2	No
Ambient temperature fore/background scan	Background	Yes
Ambient temperature scan enable	0	No
Ambient temperature broadcast enable	0	No
FDI scan address	FFF	Yes
FDI scan TOI	B	Yes
FDI scan TOR	B	Yes
FDI fore/background scan	Background	Yes
FDI scan enable	0	Yes
Flexconn address	11	No
Water dip offset	0.000,0 m	Yes

7. Select the “Gauge type” as 854, and then click **Update**.

Name	Value	IsW&M?
Gauge Type	854	Yes
Allowed gauge commands	Unknown	No
Element type	811	Yes
Lowest element position	854	Yes
Product level address	866	Yes
Product level TOI	872	Yes
Product level TOR	873	Yes
Product level dimension	877	Yes
Product level resolution	894	No
Product level fore/background scan	954	Yes
Product temperature address	970	Yes
Product temperature TOI	971	Yes
Product temperature TOR	973	Yes
Product temperature dimension	990	Yes
Product temperature resolution	B	No

2.6 End commissioning of the CIU 888

When the additional configuration settings of the CIU 888 have been configured, the next step is to end commissioning of the CIU 888.

1. Launch the CIU 888 Web interface, see section 1.4.2.

Commissioning of a Standalone System Setup

- Click **CONFIGURE** in the section menu bar.
The *Configure* window is displayed (see FIGURE 2-16).

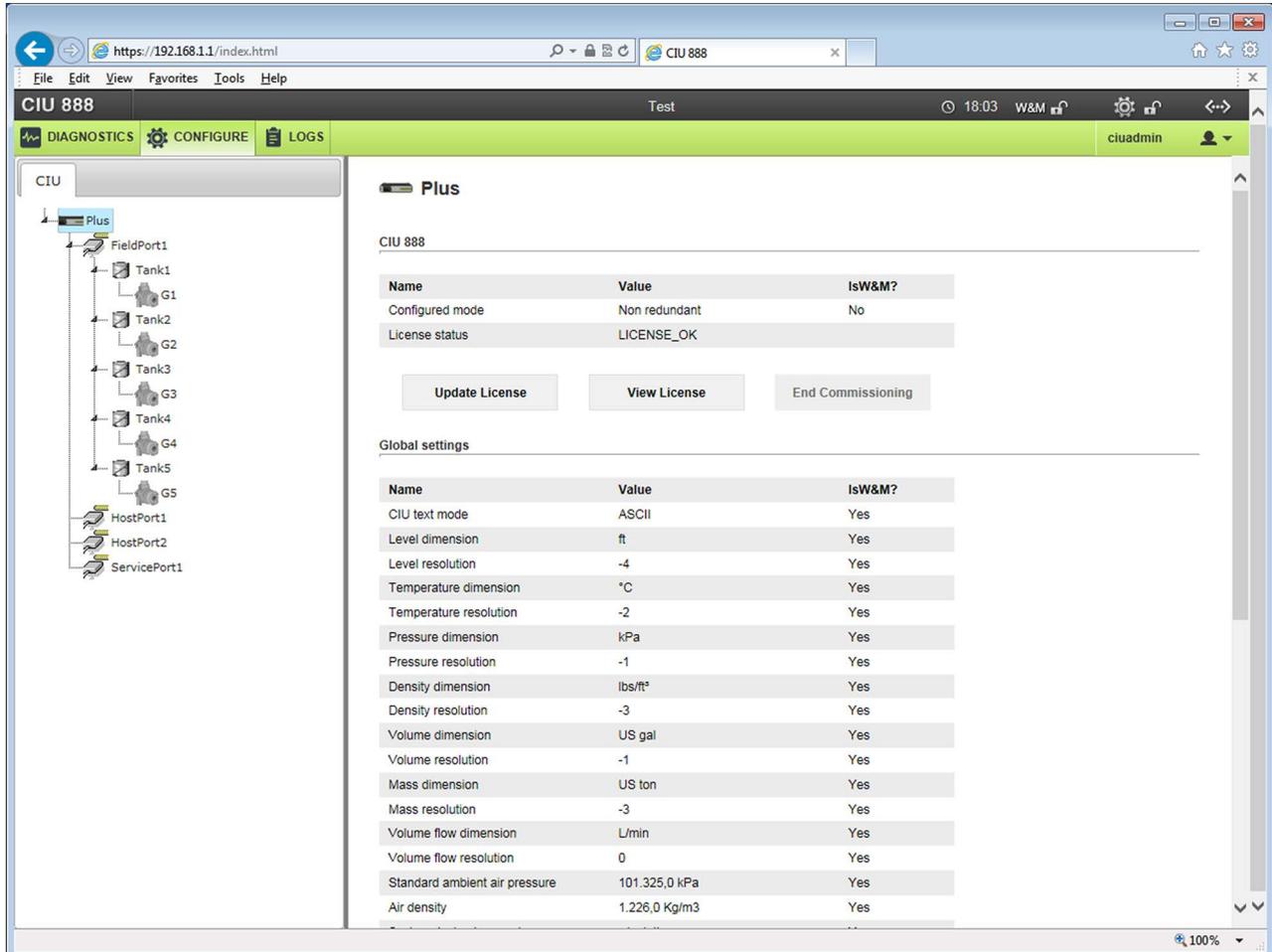


FIGURE 2-16

CIU 888 Web interface: *Configuration* window

- Click **End Commissioning**.
The following dialogue box is displayed (see FIGURE 2-17).

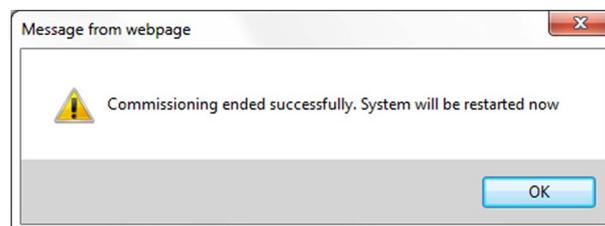


FIGURE 2-17

Commissioning ended successfully dialogue box

- Click **OK** to close the dialogue box.
The CIU 888 restarts. When the CIU 888 is restarted, it will run using the new site configuration.

2.7 Updating the INI files

When commissioning of the CIU 888 has been ended successfully, the next step is to update the INI files needed for Entis Pro.

1. In the Ensight Pro to CIU 888 Migration tool under **Ini-Files**, check the INI file path. The INI file path is automatically selected when the Ensight Pro site database has been selected. See also section 2.4.

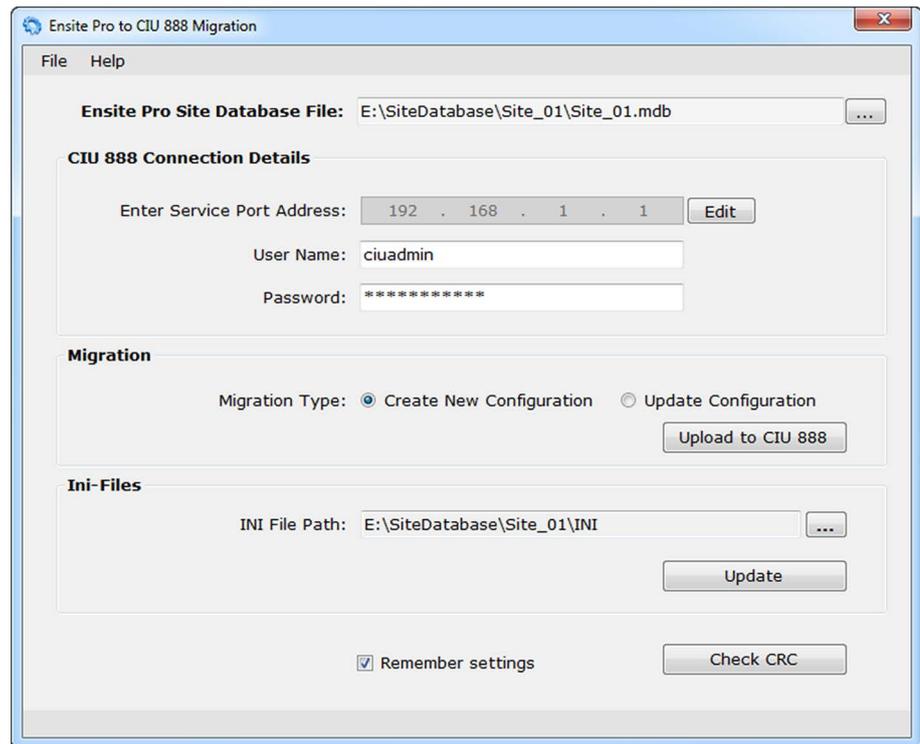


FIGURE 2-18

Ensight Pro to CIU 888 Migration tool

2. Click **Update**.

The INI files are updated. When the INI files have been updated successfully, the following dialogue box is displayed (see FIGURE 2-19):

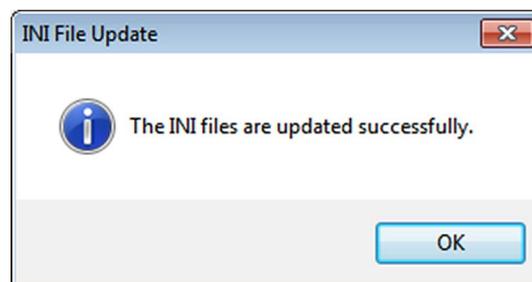


FIGURE 2-19

Ensight Pro to CIU 888 Migration tool: *INI files successfully updated* dialogue box

3. Click **OK** to close the dialogue box.

2.8 Restarting Entis Pro and loading the updated INI files in Entis Pro

When the INI files have been updated, the next step is to restart the Entis Pro system connected to the CIU 888 and then load the updated INI files in Entis Pro. Refer to the *Configuration manual Entis Pro version 2.70x for Windows 7* (Part No. 4416381) for more information.

2.9 Sealing the CIU 888

If the CIU 888 features the option to be sealed, the next step is to have it sealed by a representative of the W&M authorities or by a W&M accredited user. Refer to the *CIU 888 Sealing Guide* (Part No. 4417595) for more information.

NOTE: If the CIU 888 does not feature the option to be sealed, the W&M configuration settings can either be locked or left unlocked.

2.10 Verifying the working of the system setup

The final step in the commissioning procedure is verifying if the CIU 888 system setup is working properly.

To verify the working of the system setup, the CIU 888 must be connected to:

- PC/laptop running the CIU 888 Configuration System via:
 - Service port located at the front using a Cat. 5 Ethernet cable, **and**
 - One of the serial host ports located at the back using a serial cable (see FIGURE 2-20)

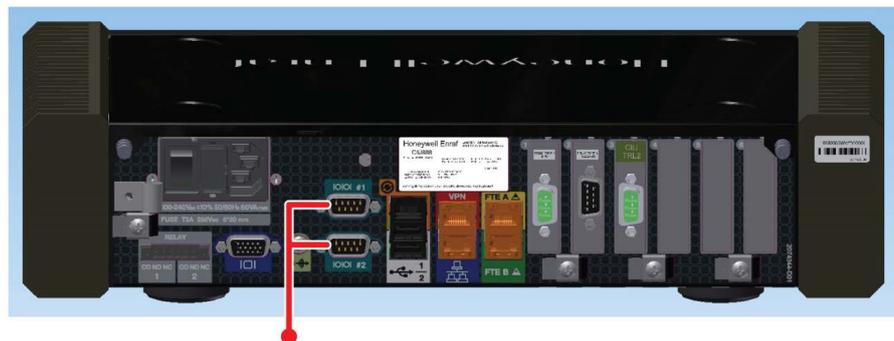


FIGURE 2-20

CIU 888: serial host ports

Procedure:

1. Launch the CIU 888 Web interface. See section 1.4.2 for more information.

Commissioning of a Standalone System Setup

2. Minimize the browser window to hide the CIU 888 Web interface but to keep it running and accessible.
3. Launch Ensite Pro, see section 1.2.1.
The Ensite Pro tool bar is displayed (see FIGURE 2-21).



FIGURE 2-21

Ensite Pro: tool bar - **Select Site** button is active

4. Click  (**Select Site** button).
The *Select Site* window is displayed (see FIGURE 2-22).



FIGURE 2-22

Ensite Pro: *Select Site* window

5. Select the appropriate site. Next, click the **Select** button.
The *Select Site* window is closed and all buttons in the Ensite Pro tool bar are active (see FIGURE 2-23).



FIGURE 2-23

Ensite Pro: Tool bar - All buttons are active

6. Check all tank data using the *Tank Viewer*.

Commissioning of a Standalone System Setup

- a) Click  (**Tank viewer** button) in the Ensite Pro tool bar.
The *Tank Viewer* window is displayed (see FIGURE 2-24).

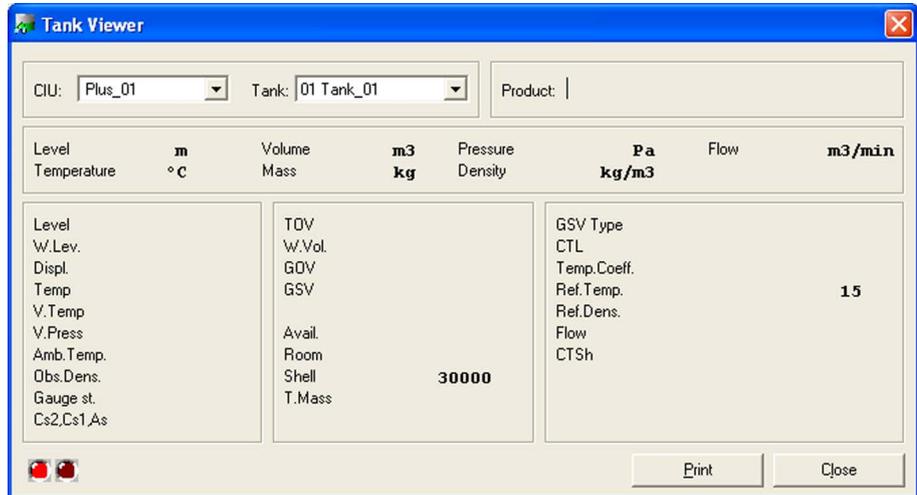


FIGURE 2-24

Ensite Pro - *Tank Viewer* window

- b) Check if the red indicator lights in the lower left side of the window are blinking. If the lights are blinking data is being sent and received.
- c) Select the CIU Plus from the drop-down list.
- d) Select the tank from the drop-down list.
The data of the selected tank will be displayed.
- e) Check the tank data for the following:
- Do the measured items match the gauge readings?
 - Is the TOV correct (based on level and STRAP tables of this tank?)
 - Are WVol, GOV and GSV reasonable?
- f) Repeat steps d through e for all tanks associated with the CIU 888.
- g) Click **Close** to close the *Tank Viewer* window.
7. Click  (**Close** button) in the Ensite Pro tool bar to close application.

CHAPTER 3 COMMISSIONING OF A REDUNDANT SYSTEM SETUP

Redundancy is a common approach to improve the reliability and availability of a system. In a redundant CIU 888 system setup, one CIU 888 (usually the primary CIU 888) has the active role and its counterpart (usually the secondary CIU 888) has the passive role. During normal operation, the CIU 888 that has the active role scans the connected gauges for data and provides the measured and calculated data to host systems.

If both CIU 888s in a redundant system setup are fully synchronized and there is a valid condition for a switchover, the CIU 888 that has the active role assumes the passive role. The CIU 888 that has the passive role assumes the active role and continues to perform the tasks that were performed by the CIU 888 that previously had the active role.

Switchover command issued by Entis Pro via Modbus serial is one such example.

NOTE: Refer to the Protocol Manual - Modbus Host (Part No. 4417588) for more information about setting up of Modbus host for redundancy.

NOTE: The active CIU 888 can either be the primary CIU 888 or the secondary CIU 888.

The redundancy status of the CIU 888 (active or passive) is presented through the following (host) systems:

- Entis Pro via Modbus serial (commands both CIU 888s)
- Other Modbus host systems
- CIU 888 display

The procedure for the commissioning of a redundant CIU 888 system setup consists of the following steps:

1. Running the initial setup of the primary CIU 888, see section 3.2
2. Setting up the site configuration and generating INI files, see section 3.3
3. Uploading the site configuration to the primary CIU 888, see section 3.4
4. Configuring the additional configuration settings of the primary CIU 888, see section 3.5
5. End commissioning of the primary CIU 888, see section 3.6
6. Commissioning of the secondary CIU 888, see section 3.7
7. Updating the INI files, see section 3.8
8. Restarting the Entis Pro system connected to the CIU 888, and loading the updated INI files in Entis Pro, see section 3.9
9. Sealing the CIU 888s, see section 3.10

10. Verifying the working of the system setup, see section 3.11

3.1 Requirements for commissioning

For commissioning of a redundant CIU 888 system setup the following requirements must be met:

- The mechanical and electrical installation of both the primary CIU 888 and the secondary CIU 888 must be completed. Refer to the *CIU 888 Installation Manual* (Part No. 4417590) for more information.
- Both the primary CIU 888 and the secondary CIU 888 must be switched on. See section 5.1.1 for more information.
- The W&M lock key switch and the Configuration lock key switch of both the primary CIU 888 and the secondary CIU 888 must be in 'unlocked' position. See section 5.2 for more information.
- The primary CIU 888 and the secondary CIU 888 must be linked through their Sync Link ports using a Cat. 5 Ethernet cable (patch or crossover). The Sync Link port is located at the back of the CIU 888 (see FIGURE 3-1).

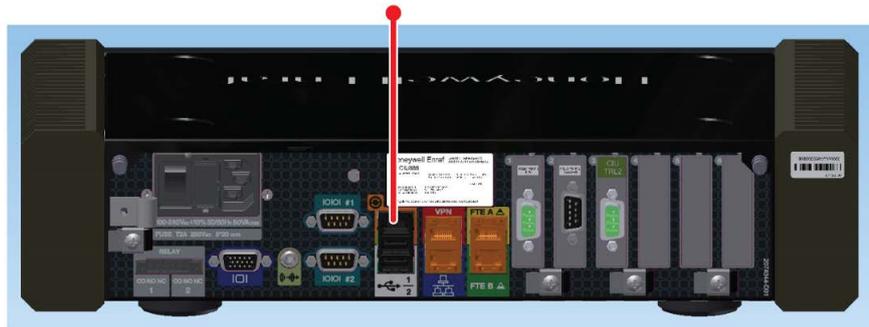


FIGURE 3-1

CIU 888: Sync Link port

- A PC/laptop running the CIU 888 Configuration System must be connected to the Service port of the primary CIU 888 using a Cat. 5 Ethernet cable (patch or crossover). The Service port is located at

the front of the CIU 888 (see FIGURE 3-2). See CHAPTER 1 for more information about the CIU 888 Configuration System.

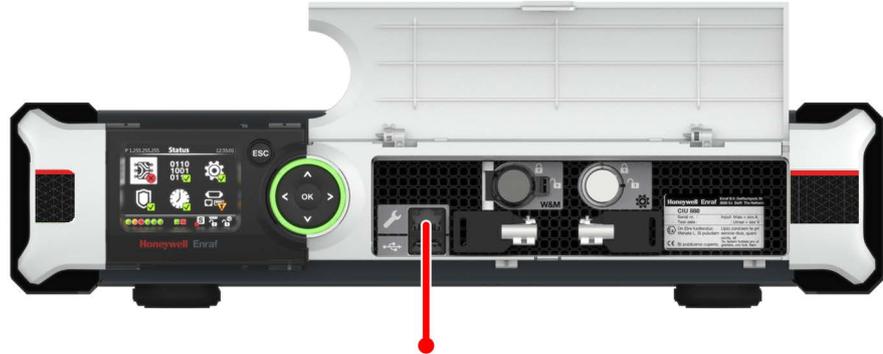


FIGURE 3-2

CIU 888: Service port

- During commissioning of the CIU 888s, the Entis Pro system(s) connected to the CIU 888s must be shut down.

3.2 Running the initial setup of the primary CIU 888

The first step in the procedure for the commissioning of a redundant CIU 888 system setup is running the initial setup of the primary CIU 888. See section 2.2 for more information.

3.3 Setting up the site configuration and generating INI files

When the initial setup of the primary CIU 888 is completed, the next step is to set up the site configuration using Entis Pro. The site configuration can be set up either by:

- Creating a new site configuration
- or
- Copying an existing CIU 880 site configuration and implementing the required changes so that the site configuration meets one of the supported topologies of deployment. The supported topologies are described in section 3.3.1.

3.3.1 Supported topologies of deployment

In case of setting up a site configuration for a redundant system setup, the following topologies of deployment are supported:

- Two pairs of CIU Plus and CIU Prime in a redundant setup, both pairs connected to one and the same host system (i.e. Entis Pro), section 3.3.1.1

- Two pairs of CIU Plus and CIU Prime in a redundant setup, each pair connected to a host system (i.e. Entis Pro), see section 3.3.1.2

NOTE: If an existing site configuration needs to be migrated, it should also be in one of the configurations described above before using the site configuration in the CIU 888. If the existing site configuration is not in one of these configurations (e.g. a single CIU Plus two CIU Primes or multiple CIU Pluses and/or CIU Primes configured in the same site database), the site configuration needs to be manually edited to match one of these configurations. Another option could be to create a copy of the existing site configuration and then delete the site elements not required to be imported. It is, of course, necessary that the mechanical and electrical installation is also adjusted so it will match the changed site configuration.

3.3.1.1 Redundant pairs of CIU Plus and CIU Prime with a single host system

In this topology, two pairs of CIU Plus and CIU Prime are configured in a redundant setup with corresponding host ports, field ports, tanks and gauges. Both pairs are connected to one and the same host system (i.e. Entis Pro). Each pair is connected to the host system via one of the four host ports of the CIU Plus.

A configured host port has its own unique RTU address and enables Modbus on serial communication.

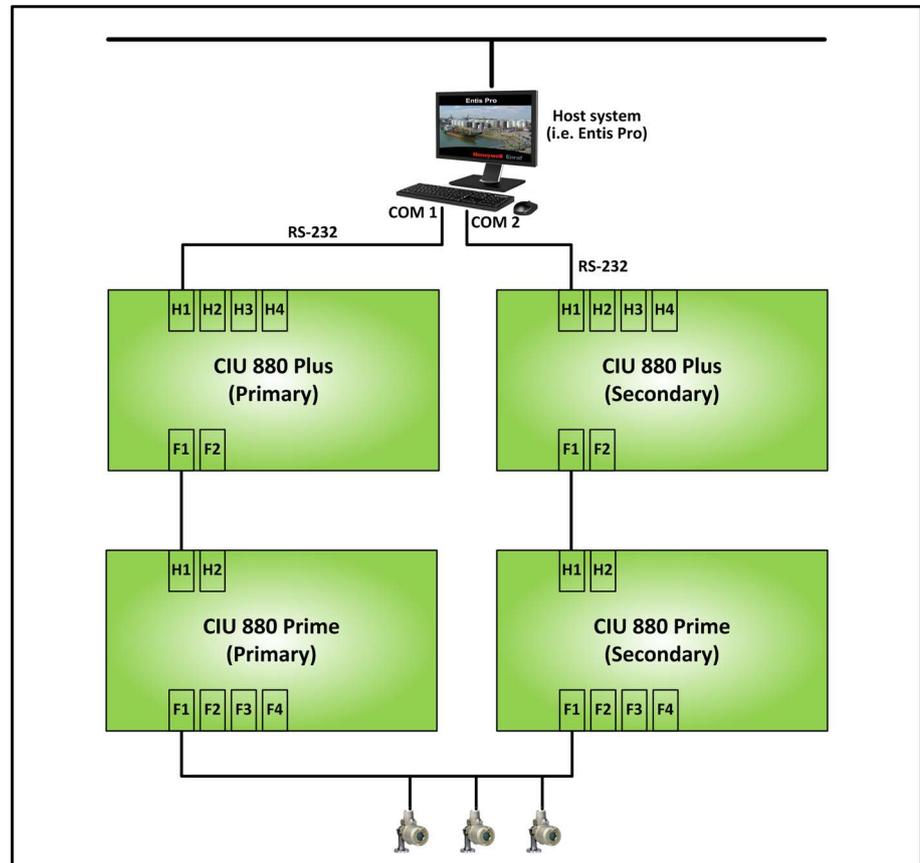


FIGURE 3-3

Schematic representation of a site with two pairs of CIU Plus and CIU Prime in a redundant setup (Single host system)

On the CIU Prime, a maximum of four field ports are available to connect to tank gauging instruments. The field ports can be configured for GPU on Bi-Phase Mark communication or GPU on serial communication.

In each pair, the CIU Prime and the CIU Plus are connected to one another via one of the host ports of the CIU Prime and one of the field ports of the CIU Plus.

NOTE: A cross-connection between the two pairs, in which the primary CIU Plus is connected to the secondary CIU Prime and the secondary CIU Plus is connected to the primary CIU Prime, is not supported.

3.3.1.2 Redundant pairs of CIU Plus and CIU Prime with redundant host systems

In this topology, two pairs of CIU Plus and CIU Prime are configured in a redundant setup with corresponding host ports, field ports, tanks and gauges. Each pair is connected to a separate host system (i.e.

Commissioning of a Redundant System Setup

Entis Pro). Each pair is connected to the host system via one of the four host ports of the CIU Plus. A configured host port has its own unique RTU address and enables Modbus on serial communication.

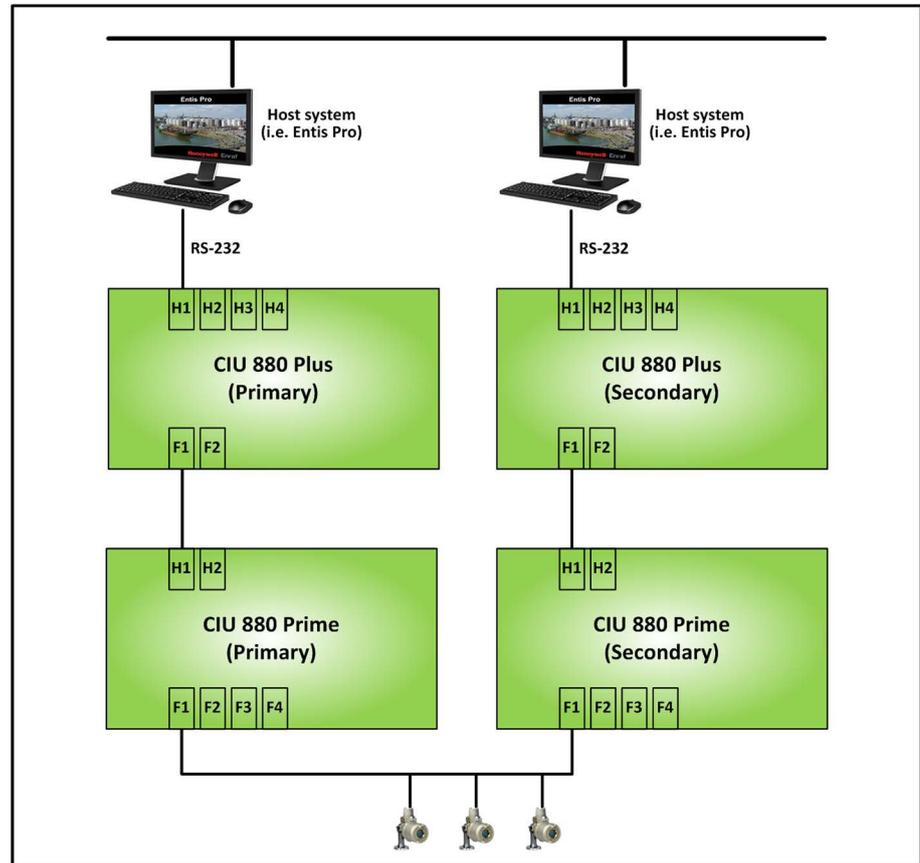


FIGURE 3-4

Schematic representation of a site with a redundant pair of CIU Plus and CIU Prime (Redundant host systems)

On the CIU Prime, a maximum of four field ports are available to connect to the tank gauging instruments. The field ports can be configured for GPU on Bi-Phase Mark communication or GPU on serial communication.

In each pair, the CIU Prime and the CIU Plus are connected to one another via one of the host ports of the CIU Prime and one of the field ports of the CIU Plus.

NOTE: A cross-connection between the two pairs, in which the primary CIU Plus is connected to the secondary CIU Prime and the secondary CIU Plus is connected to the primary CIU Prime, is not supported.

3.3.2 Mapping of host ports

FIGURE 3-5 shows an example of how the CIU Plus/CIU Prime host ports are mapped to the CIU 888 host ports in the site configuration.

NOTE: FIGURE 3-5 only shows the configuration of the primary CIU Plus host ports. The configuration of the secondary CIU Plus host ports must be identical to the configuration of the primary CIU Plus host ports.

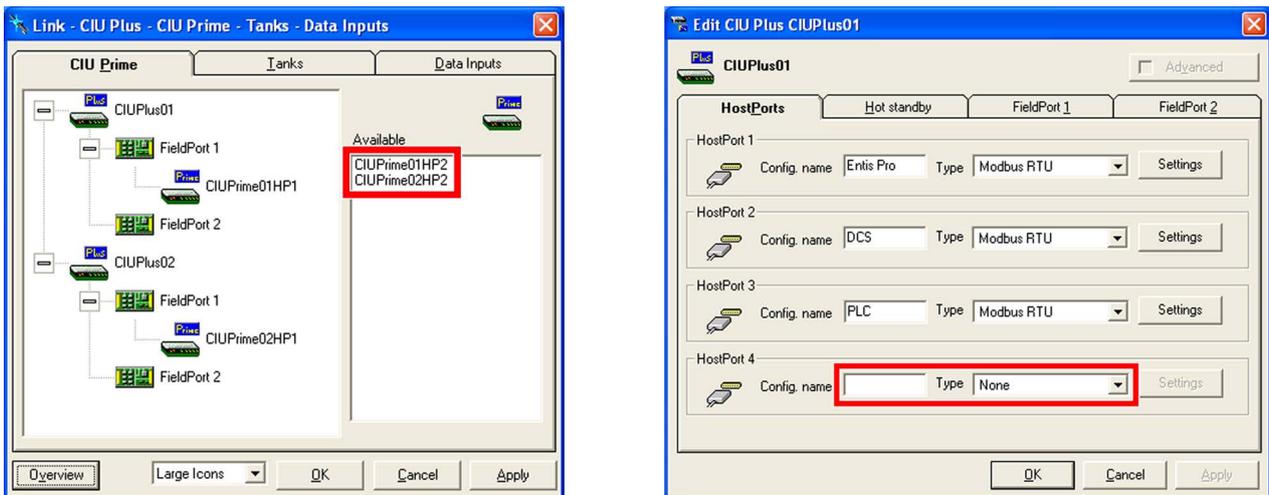


FIGURE 3-5 Mapping of CIU Prime/CIU Plus host ports to CIU 888 host ports (redundant system)

- CIU Prime host port 1 is ignored
- CIU Prime host port 2 is mapped to CIU 888 optional slot 6
- CIU Plus host port 1 is mapped to CIU 888 fixed host port 1
- CIU Plus host port 2 is mapped to CIU 888 fixed host port 2
- CIU Plus host port 3 is mapped to CIU 888 optional slot 5

CIU emulation (compatible with the CIU 858) can be configured for any of the CIU 888 host ports. For example: If CIU 888 fixed host port 2 must be enabled for CIU emulation, then in the site configuration CIU Plus host port 2 must be left unconfigured (as shown in FIGURE 3-5). CIU emulation can be configured via CIU Prime host port 2 (see FIGURE 3-6).

NOTE: FIGURE 3-6 only shows the configuration of primary CIU Prime host port 2. The configuration of secondary CIU Prime host port 2 must be identical to the

Commissioning of a Redundant System Setup

configuration of primary CIU Prime host port 2, with the exception of the RTU address which must be unique.

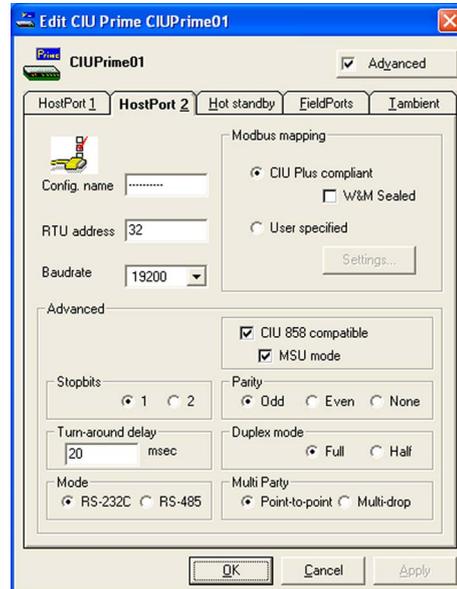


FIGURE 3-6

Ensite Pro: *Edit CIU Prime* window - CIU emulation enabled

NOTE: Refer to the *Protocol Manual - CIU Emulation (Part No. 4417589)* for more information about CIU Emulation.

3.3.3 Setting up a site configuration for a redundant CIU 888 system setup

Since the procedure for setting up the site configuration for a redundant system setup is similar to the procedure for setting up the site configuration for a standalone system setup, this section focuses on the changes that need to be made when setting up the site configuration of a redundant system setup.

NOTE: Refer to the *Instruction manual Ensite Pro Configuration Tool version 3.0 (Part No. 4416593)* for detailed information about setting up a site configuration using *Ensite Pro*.

- The site configuration for a redundant system setup contains two CIU Primes: a primary CIU Prime and a secondary CIU Prime. The configuration settings of both CIU Primes must be the same with the exception of the RTU addresses of the configured host ports. These must be unique.

Commissioning of a Redundant System Setup

The *Hot Standby enabled* option must be selected. The primary CIU Prime has the secondary CIU Prime as its counterpart, and fulfills the Primary role (see FIGURE 3-7).

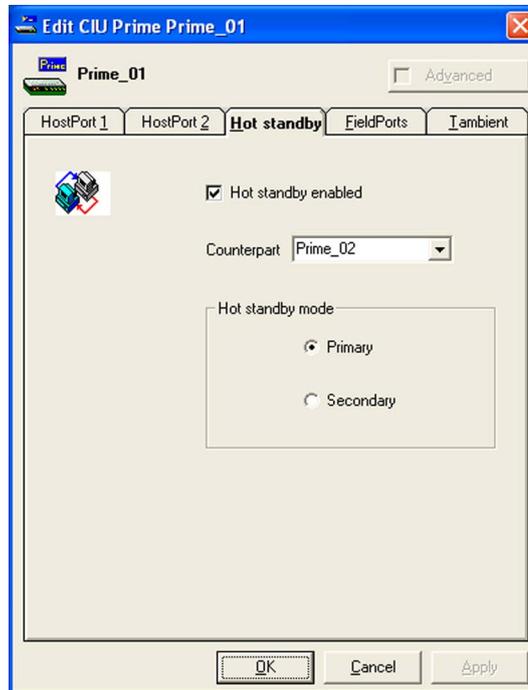


FIGURE 3-7

Ensite Pro: Hot standby configuration settings of the primary CIU Prime

Commissioning of a Redundant System Setup

The Hot standby configuration settings of the secondary CIU Prime are automatically configured based on the settings of the primary CIU Prime (see FIGURE 3-8).

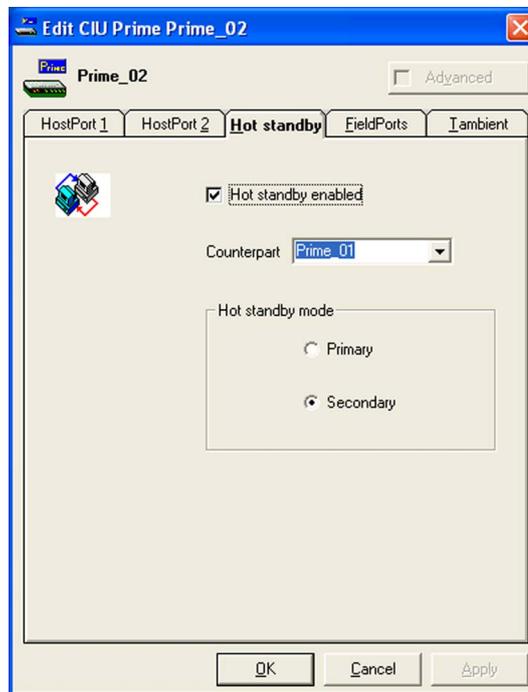


FIGURE 3-8

Ensite Pro: Hot standby configuration settings of the secondary CIU Prime

- The site configuration for a redundant system setup contains two CIU Pluses: a primary CIU Plus and a secondary CIU Plus. The configuration settings of both CIU Pluses must be the same with the exception of the RTU addresses of the configured host ports. These must be unique.

Commissioning of a Redundant System Setup

The *Hot Standby enabled* option must be selected. The primary CIU Plus has the secondary CIU Plus as its counterpart, and fulfills the Primary role (see FIGURE 3-9).

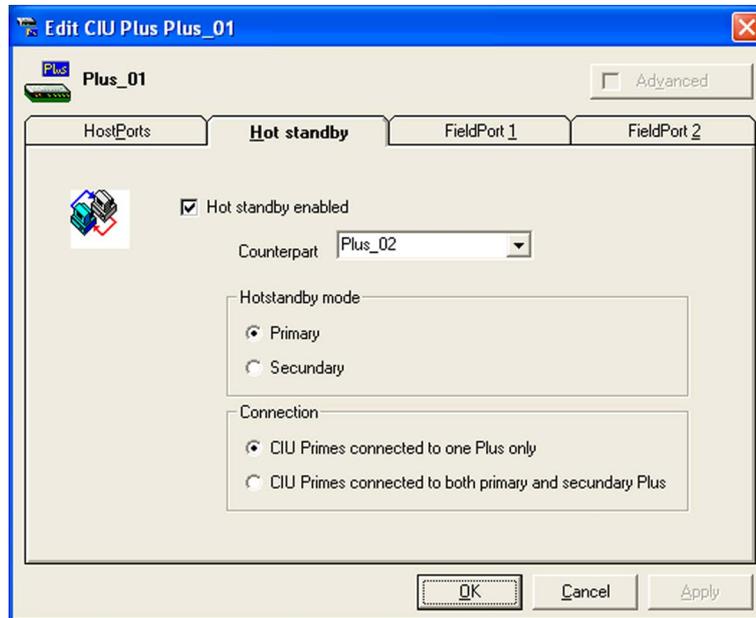


FIGURE 3-9

Ensight Pro: Hot standby configuration settings of the primary CIU Plus

The type of connection is always **CIU Primes connected to one Plus only**. With this type of connection, each CIU Prime in the redundant system setup is connected to one CIU Plus, i.e. the primary CIU Prime is connected to the primary CIU Plus, and the

Commissioning of a Redundant System Setup

secondary CIU Prime is connected to the secondary CIU Plus (see FIGURE 3-10).

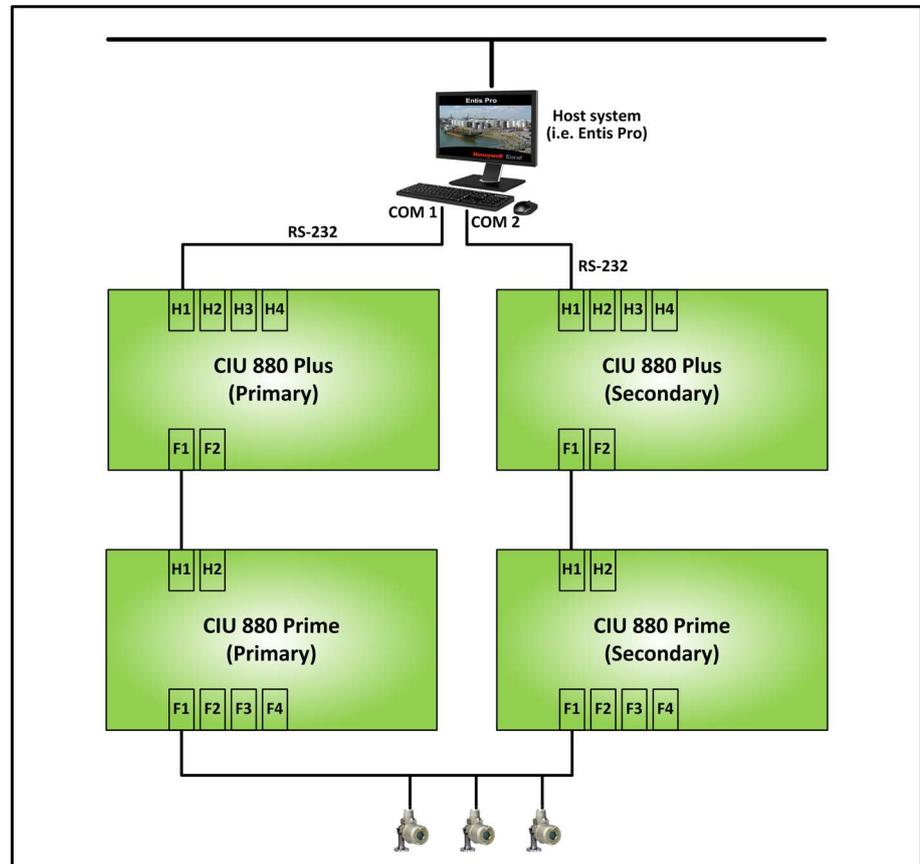


FIGURE 3-10

Redundant system setup - CIU Prime connected to single CIU Plus

NOTE: *If in an existing redundant system setup the option **CIU Primes connected to both primary and secondary Plus** is selected as type of connection, this setting has to be changed to **CIU Primes connected to one Plus only**. Furthermore, the cabling between the primary CIU Prime/CIU Plus and the secondary CIU Prime/CIU Plus needs to be changed so it will match the site configuration.*

Commissioning of a Redundant System Setup

The Hot standby configuration settings of the secondary CIU Plus are automatically configured based on the Hot standby configuration settings of the primary CIU Plus.

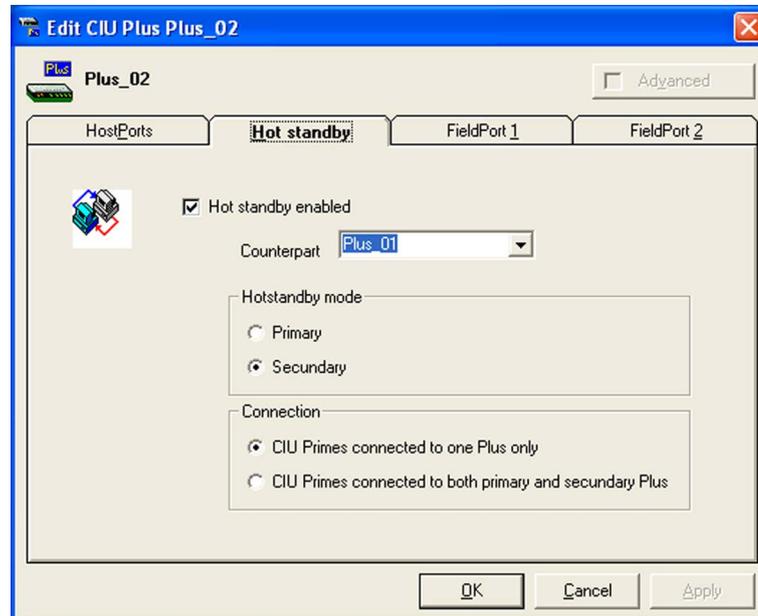


FIGURE 3-11

Ensight Pro: Hot Standby configuration settings of the secondary CIU Plus

- HostPort 1 of the primary CIU Prime must be linked to **FieldPort 1** of the primary CIU Plus (see FIGURE 3-12).

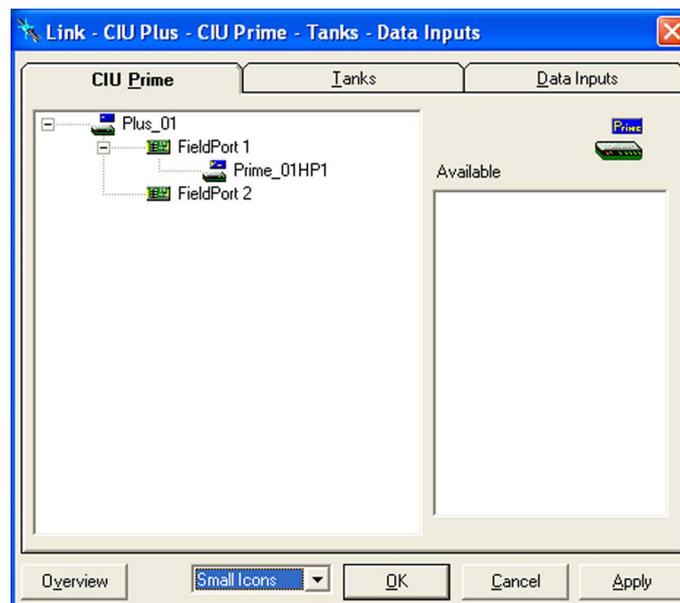


FIGURE 3-12

Ensight Pro: CIU Prime linked to CIU Plus through Field port 1

When HostPort 1 of the primary CIU Prime has been linked to FieldPort 1 of the primary CIU Plus, the HostPort 1 of the secondary CIU Prime is automatically linked to FieldPort 1 of the secondary CIU Plus (see FIGURE 3-13).

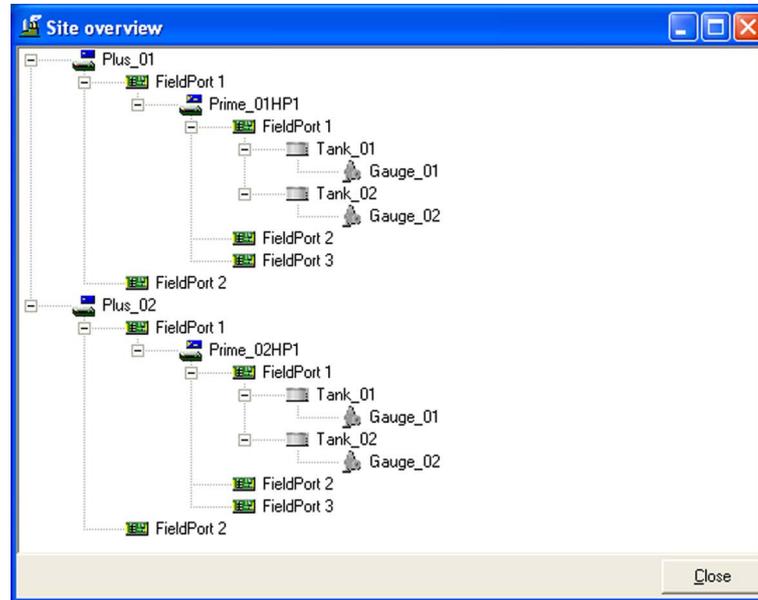


FIGURE 3-13

Ensight Pro: site overview of a redundant system setup

3.3.4 Generating INI files

When the site configuration has been set up according to one of the supported topologies of deployment, the next step is to generate the INI files needed for Entis Pro.

Refer to the *Instruction manual Ensight Pro Configuration Tool version 3.0* (Part No. 4416593) for detailed information about generating INI files using Ensight Pro.

3.4 Uploading the site configuration to the primary CIU 888

When the site configuration has been set up and the INI files have been generated, the next step is to upload the site configuration to the primary CIU 888 using the Ensight Pro to CIU 888 Migration tool. See section 2.4 for more information.

3.5 Configuring the additional configuration settings of the CIU 888

When the Ensight Pro site configuration has been uploaded to the primary CIU 888, the next step is to configure the additional configuration settings of the primary CIU 888. See section 2.5 for more information.

3.6 End commissioning of the primary CIU 888

When the additional configuration settings of the primary CIU 888 have been configured, the next step is to end commissioning of the primary CIU 888. See section 2.6 for more information.

3.7 Commissioning of the secondary CIU 888

When the primary CIU 888 has been commissioned, the next step is to configure its counterpart as preferred secondary CIU 888.

Procedure:

1. On the display of the secondary CIU 888, highlight the **Configuration** icon in the Status Dashboard using the navigation keys. Next, press the **OK** button.

The *Configuration menu* screen is displayed (see FIGURE 3-14).



FIGURE 3-14

CIU 888 display: *Configuration menu* screen

2. Highlight the **Redundancy** option using the navigation keys. Next, press the **OK** button.

The *Redundancy* screen is displayed (see FIGURE 3-15).

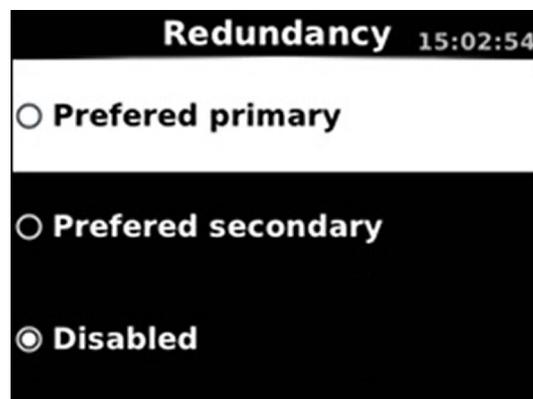


FIGURE 3-15

CIU 888 display: *Redundancy* screen

Commissioning of a Redundant System Setup

3. Highlight the **Preferred secondary** option using the navigation keys. Next, press the **OK** key. The *Confirm Changes* screen will be displayed.



FIGURE 3-16

CIU 888 display: *Confirm Changes* screen

4. Highlight the **OK** option using the display keys. Next, press the **OK** key. The secondary CIU 888 will be reset to the factory settings and will reboot twice. Because the Entis Pro system(s) connected to the CIU 888s is shutdown, redundancy switchover will be disabled during reboot.

When commissioning of both the primary CIU 888 and secondary CIU 888 has been completed, the role of each CIU 888 in the redundant system setup is indicated in the Status Dashboard (see FIGURE 3-17).

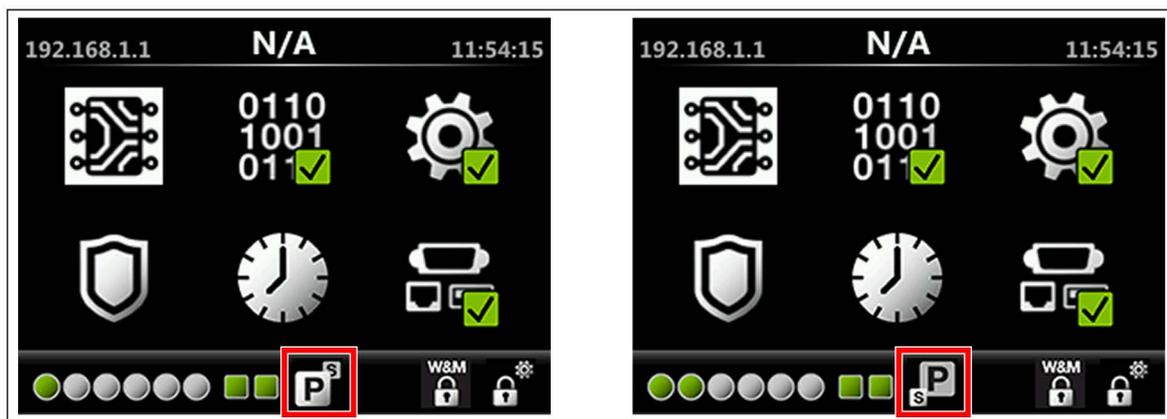


FIGURE 3-17

Status Dashboard of primary CIU 888 (left) and secondary CIU 888 (right)

3.8 Updating the INI files

When the secondary CIU 888 has been commissioned, the next step is to update the INI files needed for Entis Pro. Refer to section 4 for more information about updating INI files.

3.9 Restarting Entis Pro and loading the updated INI files in Entis Pro

When the INI files have been updated, the next step is to restart the Entis Pro system(s) connected to the CIU 888s and then load the updated INI files in Entis Pro. Refer to the *Configuration manual Entis Pro version 2.70x for Windows 7* (Part No. 4416381) for more information.

3.10 Sealing the CIU 888s

If the CIU 888s feature the option to be sealed, the next step is to have them sealed by a representative of the W&M authorities or by a W&M accredited user. Refer to the *CIU 888 Sealing Guide* (Part No. 4417595) for more information.

NOTE: If the CIU 888s do not feature the option to be sealed, the W&M configuration settings can either be locked or left unlocked.

3.11 Verifying the working of the system setup

The final step in the commissioning procedure is verifying if the redundant CIU 888 system setup is working properly. See section 2.10 for more information.

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CHAPTER 4 UPDATING CIU 888 SITE CONFIGURATION

If there are changes in the CIU 888 system setup, these changes must be implemented in the site configuration. Subsequently, the updated site configuration must be uploaded to the CIU 888 for the changes to become effective.

Changes in the CIU 888 system setup can be the result of, for example:

- Connection of additional tank gauging instruments to the CIU 888
- Connection of additional host systems to the CIU 888
- Installation of a new CIU 888 license resulting in the expansion of the features and functionalities of the CIU 888 (e.g. redundancy, support of a larger number of tanks)

The procedure for updating the CIU 888 site configuration consists of the following steps:

1. Implementing the required changes in the site configuration and regenerating the INI files, see section 4.2
2. Regenerating the INI files required for Entis Pro, see section 4.3
3. Uploading the updated site configuration to the CIU 888, see section 4.4
4. If required, configuring the additional configuration settings, see section 4.5
5. Updating the INI files required for Entis Pro, see section 4.6
6. Restarting the Entis Pro system connected to the CIU 888, and reloading the INI files in Entis Pro, see section 4.7
7. Sealing the CIU 888, see section 4.8
8. Verifying the working of the system setup, see section 4.9

4.1 Requirements for updating the CIU 888 site configuration

The following requirements must have been met in order to update the CIU 888 site configuration:

- The CIU 888 must be switched on. See section 5.1.1 for more information.
- Both the W&M lock key switch and the Configuration lock key switch of the CIU 888 must be in 'unlocked' position. See section 5.2 for more information.
- A PC/laptop running the CIU 888 Configuration System must be connected to the Service port of the CIU 888 using a Cat. 5 Ethernet cable (patch or crossover). The Service port is located at the front of

Updating CIU 888 Site configuration

the CIU 888 (see FIGURE 4-1). See Chapter 1 for more information about the CIU 888 Configuration System.

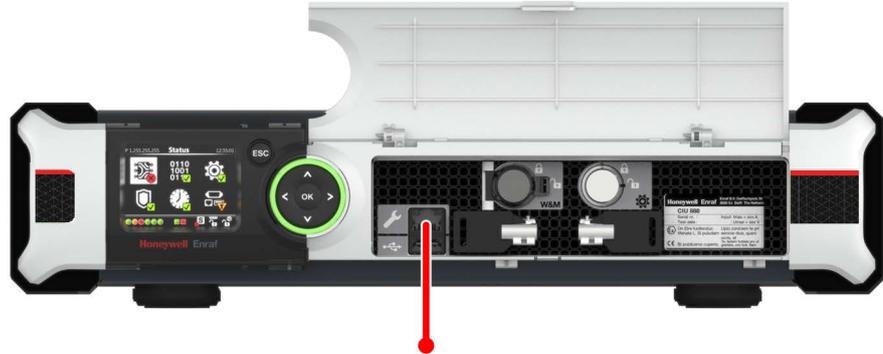


FIGURE 4-1 CIU 888: Service port

- During updating of the CIU 888 site configuration, the Entis Pro system connected to the CIU 888 must be shut down.

4.2 Implementing the required changes in the site configuration

The first step in updating the CIU 888 site configuration is implementing the required changes in the site configuration.

Procedure:

1. Launch Ensight Pro, see section 1.2.1.
The Ensight Pro tool bar is displayed (see FIGURE 4-2).

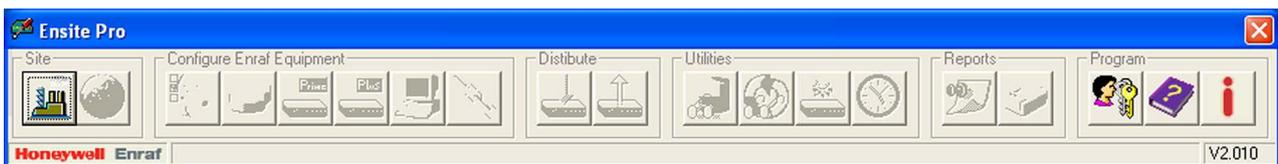


FIGURE 4-2 Ensight Pro: Tool bar - Only **Select Site** button is active

2. Click  (**Select Site**) in the Ensate Pro tool bar.
The *Select Site* window is displayed (see FIGURE 4-3).



FIGURE 4-3

Select Site window

3. Select the site from the list. Next, click **Select**.
All buttons in the Ensate Pro tool bar will become active (see FIGURE 4-4).



FIGURE 4-4

Ensate Pro: Tool bar - All buttons are active

4. Implement the required changes to the site configuration.

Refer to the *Instruction manual Ensate Pro Configuration Tool version 3.0* (Part No. 4416593) for detailed information about the complete configuration procedure in Ensate Pro.

4.3 Regenerating the INI files

When the required changes in the site configuration have been implemented, the next step is to regenerate the INI files needed for Entis Pro. Refer to the *Instruction manual Ensate Pro Configuration Tool version 3.0* (Part No. 4416593) for detailed information about generating INI files using Ensate Pro.

4.4 Uploading the updated site configuration to the CIU 888

When the INI files have been regenerated, the next step is to upload the updated site configuration to the CIU 888.

Procedure:

1. Launch the Ensight Pro to CIU 888 Migration tool.
The Ensight Pro to CIU 888 Migration tool is displayed (see FIGURE 4-5).

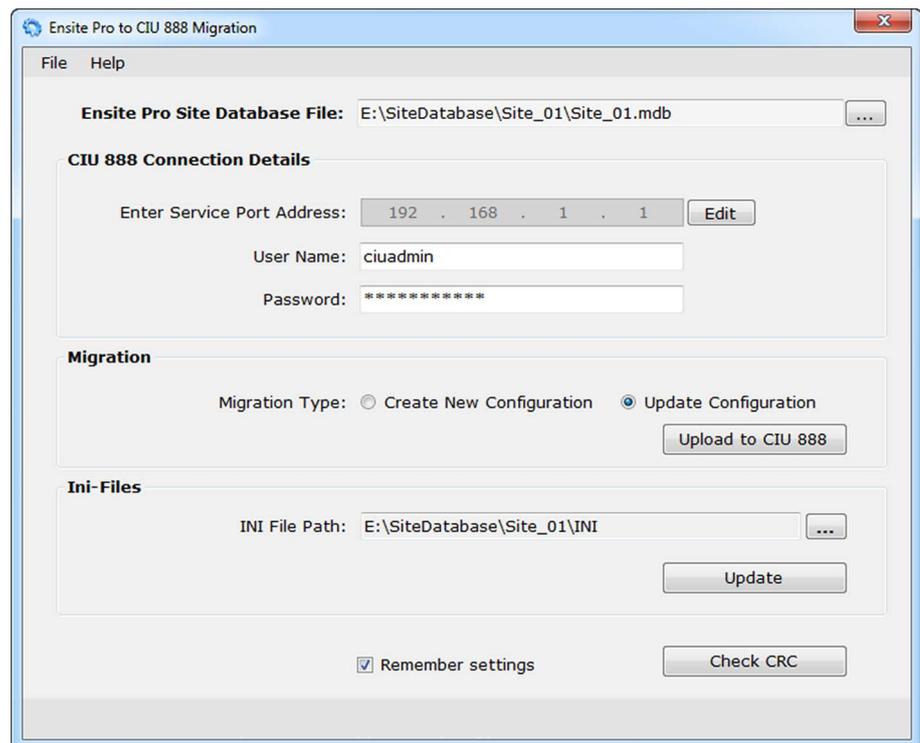


FIGURE 4-5

Ensight Pro to CIU 888 Migration tool

2. Enter the following information:
 - **Ensight Pro Site Database File**
Select the Ensight Pro site database (*.mdb file). Click  (**Browse**) to browse to the appropriate folder and then select the *.mdb file.
After selecting the site database file, the file name including the full path is displayed.
 - **Enter Service Port Address**
The IP address 192.168.1.1 is displayed. Leave this address unchanged.
 - **User Name**
Enter the user name, i.e. ciuadmin.
 - **Password**
Enter the password of the ciuadmin user account.

Updating CIU 888 Site configuration

- **Migration Type**
Select the **Update Configuration** option.

NOTE: The difference between the **Create New Configuration** option and the **Update Configuration** option is described in TABLE 4-1:

TABLE 4-1

Difference between *Create New Configuration* and *Update Configuration* option

Create New Configuration:	Deletes the existing site configuration completely (if already uploaded) and uploads the new site configuration to the CIU 888. The Create New Configuration operation can only be performed after a Reset to Factory Defaults operation via the CIU 888 display has been performed or after the CIU 888 has been dispatched from the factory.
Update Configuration	Uploads the implemented changes to the site configuration that is already uploaded to the CIU 888. An Update Configuration operation is allowed only on a commissioned CIU 888.

- **INI File Path**
When the Ensite Pro site database file has been selected, the path to the folder where the INI files will be stored is automatically selected. If necessary, you can change the folder by clicking (Browse) to browse to the appropriate folder.
- **Remember settings**
Select the check box if the current settings must be saved.



CAUTION! If the user selects Migration Type as "Create New Configuration" instead of "Update Configuration" and tries to Upload the configuration to CIU 888, it may trigger unexpected results and user may not be able to perform update configuration again. The only way to recover from this situation is to do a factory reset of the CIU 888 and recommission the CIU 888.

3. Click **Upload to CIU 888**.

If the implemented changes do not require a restart of the CIU 888, the following dialogue box is displayed:

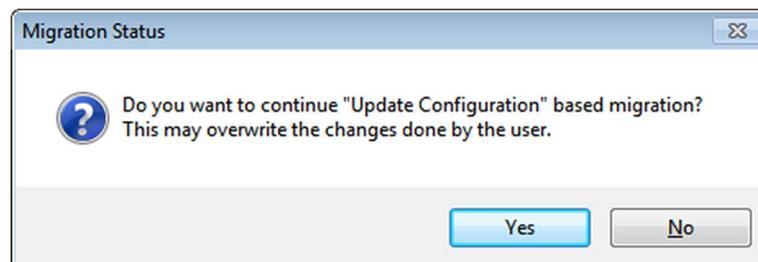


FIGURE 4-6

Migration tool: *Migration Status* dialogue box (No restart of CIU 888 required)

If the implemented changes require a restart of the CIU 888, the following dialogue box is displayed (see FIGURE 4-7):

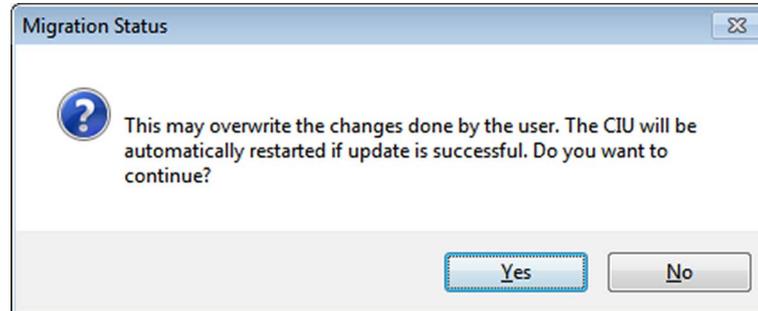


FIGURE 4-7 Migration tool: *Migration Status* dialogue box (Restart of CIU 888 required)

4. Click **Yes**.

The implemented changes to the site configuration are uploaded to the CIU 888.

When the implemented changes have been successfully uploaded and the changes did not required a restart of the CIU 888, the following dialogue box is displayed (see FIGURE 4-8).

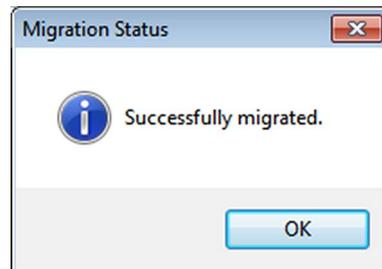


FIGURE 4-8 Migration tool: *Successfully Migrated* dialogue box

When the implemented changes have been successfully uploaded and the changes required a restart of the CIU 888, the following dialogue box is displayed (see FIGURE 4-8).

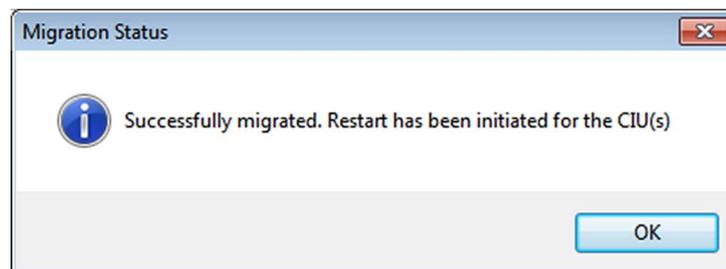


FIGURE 4-9 Migration tool: *Successfully Migrated* dialogue box (after restart of CIU 888)

5. Click **OK** to close the dialogue box.

Depending on the entities that were changed during the update, the CIU 888 will automatically restart after the upload. See TABLE A.3, to view list of entities that do not require a restart after they have been changed.

4.5 Configuring the additional configuration settings

When the implemented changes in the site configuration have been uploaded to the CIU 888, the next step is to configure the additional configuration settings of the CIU 888 if required. See section 2.5 for more information.

4.6 Updating the INI files

When the updated site configuration has been uploaded to the CIU 888 and the additional configuration settings, if required, have been configured, the next step is to update the INI files needed for Entis Pro. See section 4 for more information.

4.7 Restarting Entis Pro and reloading updated INI files in Entis Pro

When the INI files have been updated, the next step is to restart the Entis Pro system connected to the CIU 888 and then reload the updated INI files in Entis Pro. Refer to the *Configuration manual Entis Pro version 2.70x for Windows 7* (Part No. 4416381) for more information.

4.8 Sealing the CIU 888

If the CIU 888 features the option to be sealed, the next step is to have it sealed by a representative of the W&M authorities or by a W&M accredited user. Refer to the *CIU 888 Sealing Guide* (Part No. 4417595) for more information.

NOTE: If the CIU 888 does not feature the option to be sealed, the W&M configuration settings can either be locked or left unlocked.

4.9 Verifying the working of the CIU 888 system setup

The final step in the procedure for updating the CIU 888 system setup is verifying if the system setup is working properly. See section 2.10 for more information.

CHAPTER 5 GENERAL CIU 888 FUNCTIONS

5.1 (Re)starting and shutting down the CIU 888

5.1.1 Starting the CIU 888

When the CIU 888 is connected to the mains, you can start the CIU 888 using the on/off switch at the back of the device (see FIGURE 5-1).



FIGURE 5-1

CIU 888: on/off switch

During startup, the *CIU 888 Loading...* splash screen is shown on the CIU 888 display (see FIGURE 5-2).

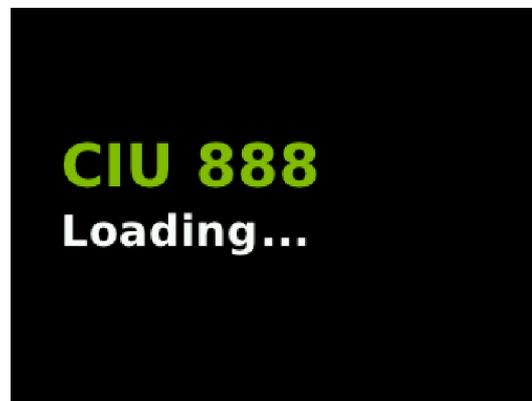


FIGURE 5-2

CIU 888 display: *CIU 888 Loading...* splash screen

NOTE: *If the CIU 888 is built into a storage cabinet, the on/off switch should be in the 'ON' position as it is no longer accessible. In this case, you can start the CIU 888 by switching on the mains.*

5.1.2 Restarting the CIU 888

You can restart the CIU 888 via the CIU 888 Web interface. To restart the CIU 888, select **Restart CIU** from the *CIU 888* menu (see FIGURE 5-3).

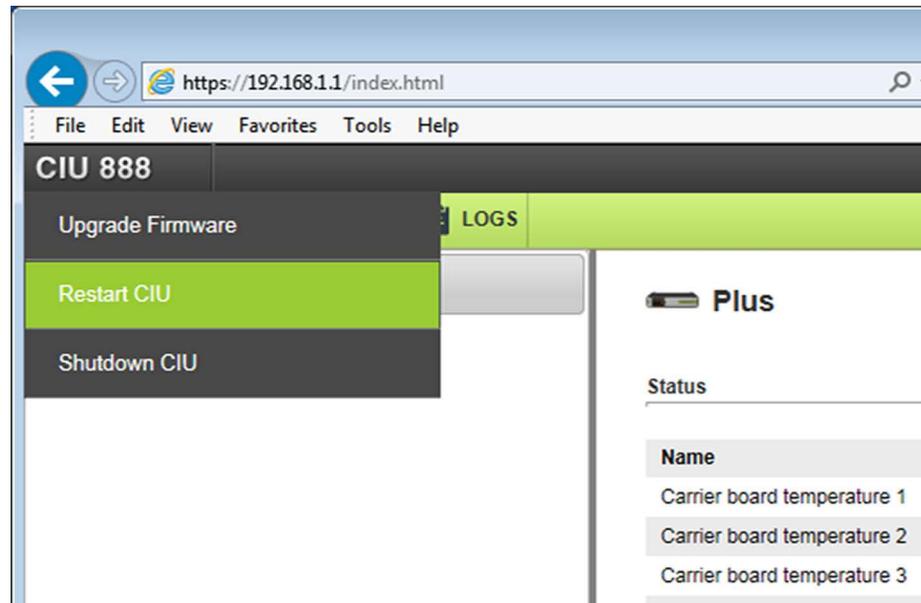


FIGURE 5-3

CIU 888 Web interface: *Restart CIU* option in *CIU 888* menu

During restart, the *CIU 888 Restarting...* splash screen is shown on the CIU 888 display (see FIGURE 5-4).

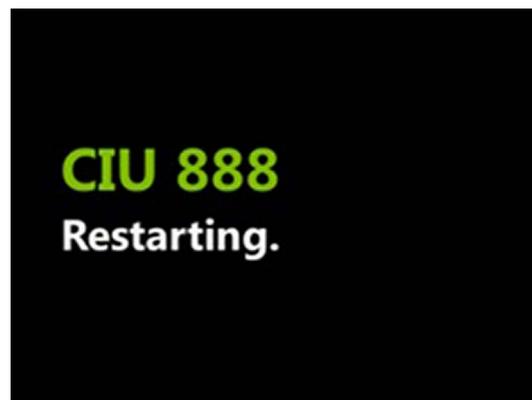


FIGURE 5-4

CIU 888 display: *CIU 888 Restarting...* splash screen

5.1.3 Shutting down the CIU 888

Shutting down the CIU 888 is necessary if, for instance, maintenance must be performed on the CIU 888 or if the CIU 888 must be replaced. You can shut down the CIU 888 via the CIU 888 Web interface. To shut

down the CIU 888, select **Shutdown CIU** from the *CIU 888* menu (see FIGURE 5-5).

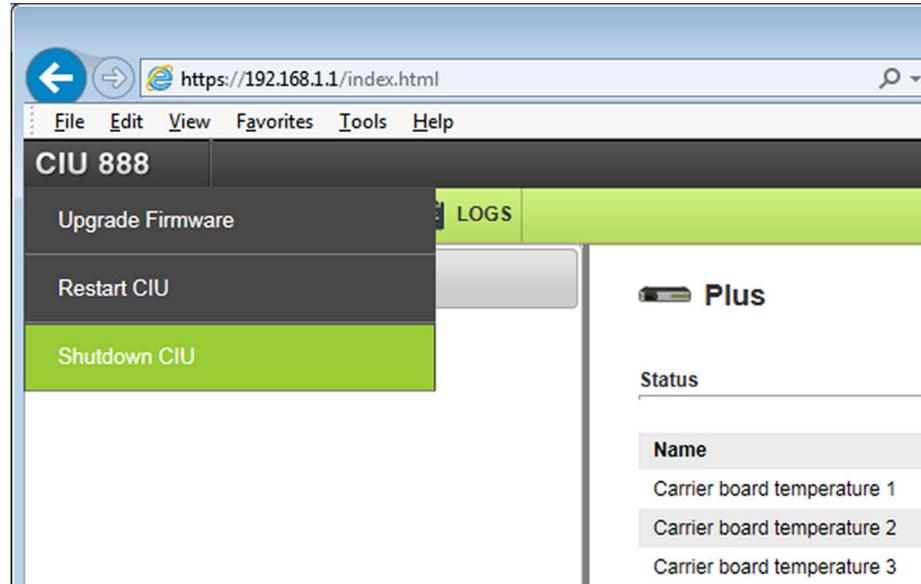


FIGURE 5-5

CIU 888 Web interface: *Shutdown CIU* option in *CIU 888* menu

NOTE: To switch the CIU 888 back on, use the on/off switch at the back of the device, see section 5.1.1. Because the on/off switch is still in the 'ON' position, the on/off switch must be switched to the 'OFF' position first. Subsequently, the CIU 888 can be started by switching the on/off switch to the 'ON' position.

5.2 W&M lock key switch and Configuration lock key switch

The CIU 888 features two key switches located at the front of the device:

- W&M lock key switch, see section 5.2.1.
- Configuration lock key switch, see section 5.2.2.

5.2.1 W&M lock key switch

The W&M lock key switch is used for locking and unlocking the W&M relevant configuration settings of the CIU 888. The key switch is located at the front of the CIU 888, and is fitted with a cover (see FIGURE 5-6).



FIGURE 5-6

CIU 888: W&M lock key switch

5.2.1.1 Unlocking the W&M relevant configuration settings

Perform the following steps to unlock the W&M relevant configuration settings of the CIU 888:

1. If the cover of the W&M lock key switch is sealed, remove the hardware seal (wire) in order to get access to the key switch.
2. Take the key for locking/unlocking the W&M relevant configuration settings and insert it in the key switch. Next, turn the key counter-clockwise.

On the CIU 888 display, the status of the W&M lock key switch changes from  ('locked') to  ('unlocked') (see FIGURE 5-7).



FIGURE 5-7

CIU 888 display: W&M relevant configuration settings are unlocked

3. Remove the key from the key switch and store it.

5.2.1.2 Locking the W&M relevant configuration settings

Perform the following steps to lock the W&M relevant configuration settings of the CIU 888:

1. Take the key for locking/unlocking the W&M relevant configuration settings.
2. Insert the key in the W&M lock key switch. Next, turn the key clockwise.

On the CIU 888 display, the status of the W&M lock key switch changes from  ('unlocked') to  ('locked') (see FIGURE 5-8).



FIGURE 5-8

CIU 888 display: W&M relevant configuration settings are locked

3. Remove the key from the key switch and store it.

5.2.2 Configuration lock key switch

The Configuration lock key switch is used for locking and unlocking the configuration settings (non-W&M relevant and W&M relevant) of the CIU 888. The key switch is located at the front of the CIU 888 (see FIGURE 5-9).



FIGURE 5-9 CIU 888: Configuration lock key switch

5.2.2.1 Unlocking the configuration settings

Perform the following steps to unlock the configuration settings of the CIU 888:

1. Take the key for locking/unlocking the configuration settings.
2. Insert the key in the Configuration lock key switch, and then turn the key counterclockwise.

On the Status Dashboard, the status of the Configuration lock key switch changes from  ('locked') to  ('unlocked') (see FIGURE 5-10).



FIGURE 5-10 Status Dashboard: configuration settings are unlocked

3. Remove the key from the key switch and store it.

5.2.2.2 Locking the configuration settings

Perform the following steps to lock the configuration settings of the CIU 888:

1. Take the key for locking/unlocking the configuration settings.
2. Insert the key in the Configuration lock key switch, and then turn the key clockwise.

On the Status Dashboard, the status of the Configuration lock key switch changes from  ('unlocked') to  ('locked') (see FIGURE 5-11).



FIGURE 5-11

Status Dashboard: configuration settings are locked

3. Remove the key from the key switch and store it.

5.3 Safe mode of CIU 888

CIU 888 safe mode is a mode in which CIU operates with restricted features. Core CIU 888 functionalities like scanning, giving data to Modbus host, redundancy would not work in this mode. For certain CIU 888 migrations involving firmware upgrades from previous releases Entering Safe mode may be recommended step in the upgrade procedure.

5.3.1 Entering Safe mode



CAUTION! Do not perform Enter Safe Mode unless it is specified as a step in any of the configuration procedures (or) firmware upgrade procedures.

You can enter safe mode of CIU 888 via the CIU 888 Web interface. To enter safe mode, select **Enter Safe Mode** from the CIU 888 menu (see figure 5-12).

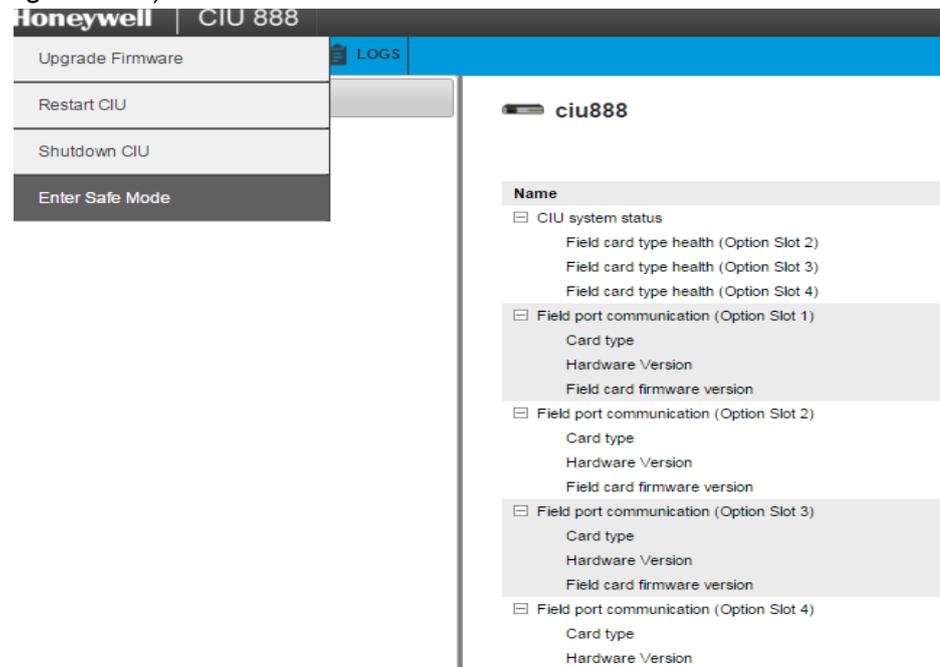


FIGURE 5-12

CIU 888 Web interface: Enter Safe Mode option in CIU 888 menu

5.3.2 Exiting Safe mode

To resume normal operation of CIU 888 from Safe mode, the user shall select **Exit Safe Mode** from CIU 888 Menu in the Web interface.



CAUTION! Do not perform Exit Safe Mode unless it is specified as a step in any of the configuration procedures (or) firmware upgrade procedures.

General CIU 888 Functions

You can exit safe mode of CIU 888 via the CIU 888 Web interface. To exit safe mode, select Exit Safe Mode from the CIU 888 menu (see figure 5-13)



CIU is running in safe mode and CIU operations are disabled!!
To resume normal CIU operations, select Exit Safe Mode from the Main Menu.

FIGURE 5-13

CIU 888 Web interface: Exit Safe Mode option in CIU 888 menu

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CHAPTER 6 ADVANCED CIU 888 SETTINGS

6.1 Setting the date and time of the CIU 888

The date and time of the CIU 888 can be configured during commissioning/configuration of the CIU 888. Subsequently, the date and time are set when the site configuration is uploaded to the CIU 888.

To set the date and time, the CIU 888 must be connected to the PC/laptop running Ensight Pro (part of the CIU 888 Configuration System) via:

- Service port located at the front of the CIU 888 using a Cat. 5 Ethernet cable (see FIGURE 6-1)

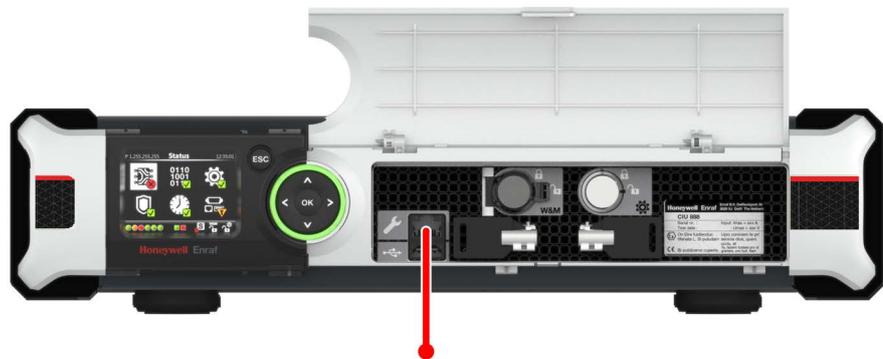


FIGURE 6-1 CIU 888: Service port

and

- One of the serial host ports located at the back of the CIU 888 using a serial cable (see FIGURE 6-2)

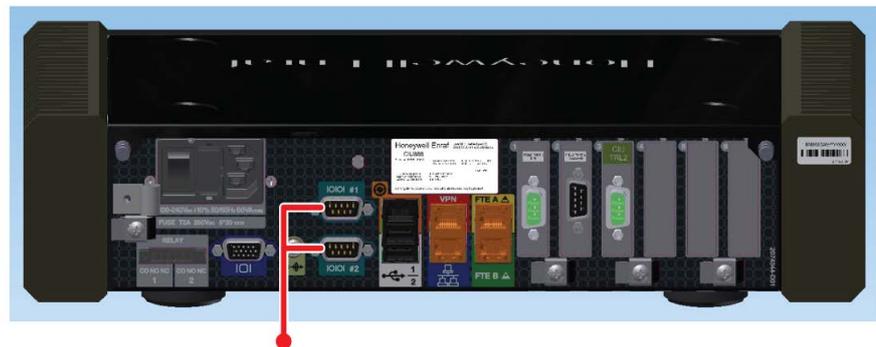


FIGURE 6-2 CIU 888: serial host ports

Furthermore, communication between the CIU 888 and Ensight Pro system must be established.

During commissioning/configuration of the CIU 888 using Ensight Pro, perform the following steps to configure the date and time:

1. Click  (*Set Date & Time*) in the Ensight Pro toolbar.
The *Set Date & Time* window is displayed (see FIGURE 6-3). By default, the current time and date are displayed.

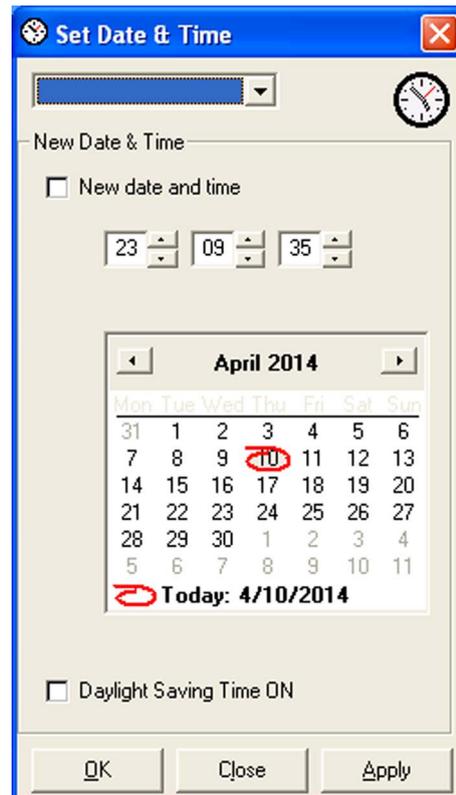


FIGURE 6-3

Ensight Pro - *Set Date & Time* window

2. From the drop-down list, select the CIU for which you want to set the date and time.
3. Enable the **New date and time** check box if you want to set a new date and time.
4. Enter the time. The format is: Hours (00...23) - Minutes (00...59) - Seconds (00...59). Use the arrow buttons to increase or decrease the hours, minutes or seconds.
5. Select the month and year in the calendar. Next, select the day from the calendar. Use the arrow buttons to display the previous or the next month.
6. Enable the **Daylight Saving Time ON** check box, if necessary.

Advanced CIU 888 Settings

REMARK: If the “Daylight Saving Time ON” option is enabled (checked), the clock is adjusted forward one hour near the start of spring and adjusted backward one hour in the autumn.

7. Click the **OK** button to save the settings and to close the window.

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APPENDIX A DATA HANDLING

A.1 Engineering units

System engineering units are required for proper rounding of the internal engineering units. The system engineering units are selected during the configuration of the CIU 888, but also in a later stadium when the settings of the CIU 888 are configured (partly or fully) and the CIU 888 is operational. The CIU 888 Web interface presents the configuration settings in the selected system engineering units.

The CIU 888 supports the same set of engineering units as supported by Ensight Pro version 3.0. Furthermore, the CIU 888 supports all the possible engineering units of each supported gauge type as far as these are supported by the CIU 880 Prime.

A.2 Data presentation

A.2.1 Decimal and thousand separators

A.2.1.1 Decimal separator

The CIU 888 displays its floating point numeric data with a decimal separator which is either a dot (default) or a comma. Other characters are not allowed. A number cannot start nor end with a decimal separator. So '0.2' is correct, but '.2' is not correct.

NOTE: The decimal separator parameter falls under the W&M seal.

A.2.1.2 Thousand separator

The CIU 888 displays its numeric data with a thousand separator which is either a dot, a comma (default) or no separator. Other characters are not allowed. The thousand separator is applied before and after the decimal separator to group three digits. A number cannot start nor end with a thousand separator.

NOTE: The thousand separator parameter falls under the W&M seal.

A.2.1.3 Configuring the decimal separator and thousand separator

The decimal separator and thousand separator are both initialized during setup of the site configuration in Ensight Pro, and are taken from the settings configured for the PC/laptop running Ensight Pro.

To configure the decimal separator and thousand separator:

1. On the PC/laptop running Ensight Pro, go to  (**Start**) > **Control Panel**.
The *Control Panel* is displayed (see FIGURE A-1).

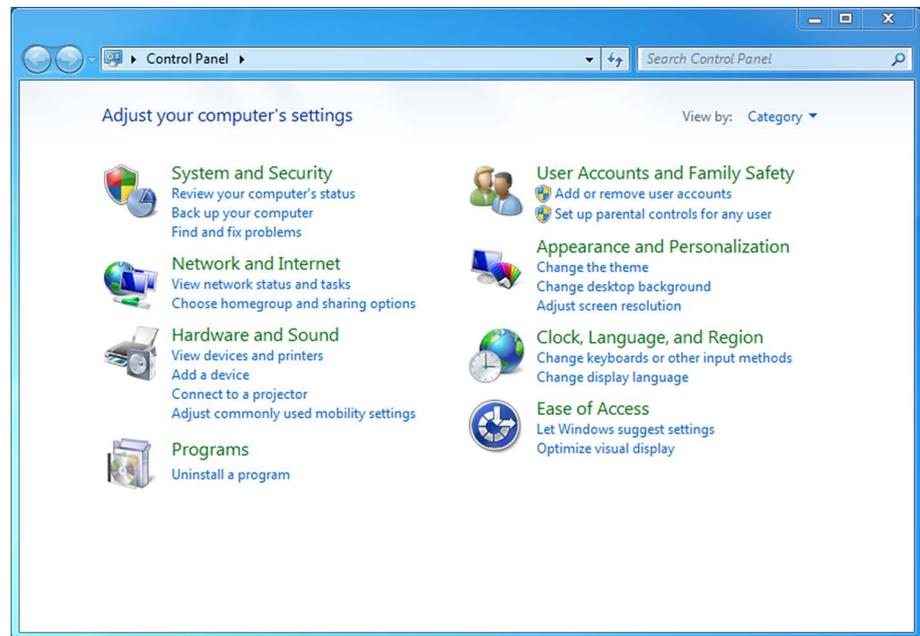


FIGURE A-1

Control Panel

2. Click **Clock, Language, and Region**.

The *Clock, Language, and Region* applet is displayed (see FIGURE A-2).

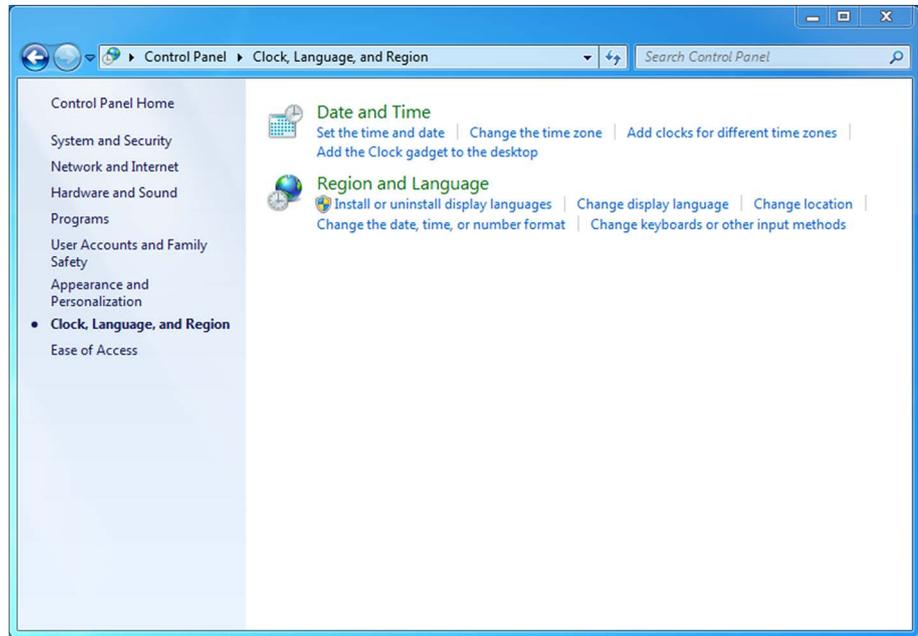


FIGURE A-2

Control Panel: Clock, Language, and Region applet

-
3. Click **Region and Language**.
The *Region and Language* window is displayed. By default, the *Formats* tab is displayed (see FIGURE A-3).

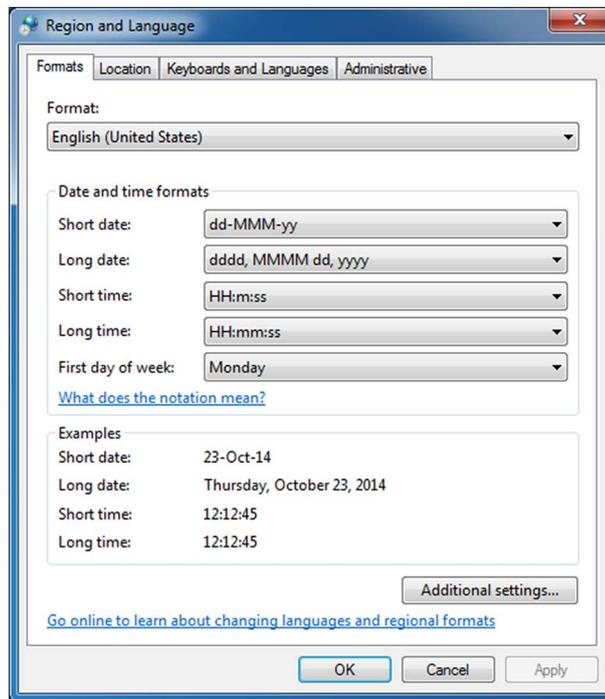


FIGURE A-3

Region and Language window

4. Click **Additional settings...**

The *Customize Format* window is displayed (see FIGURE A-4).

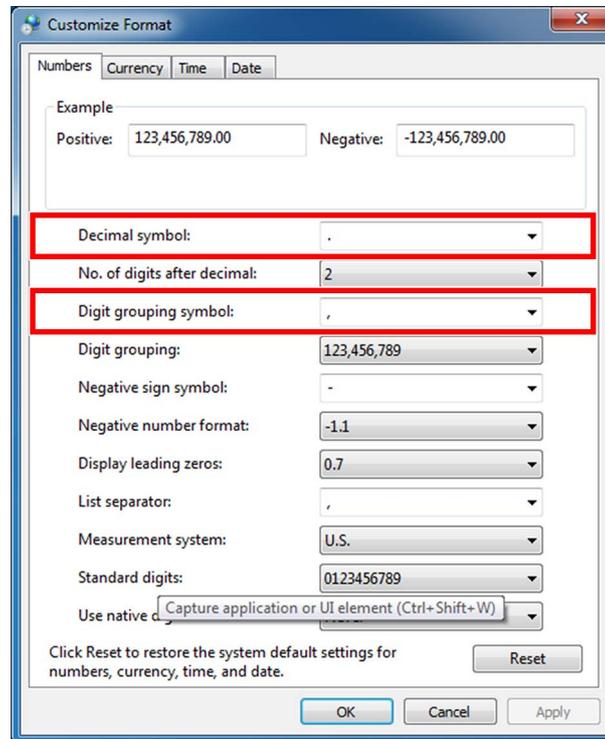


FIGURE A-4

Customize Format window

5. From the list box next to 'Decimal symbol:' select the symbol to be used as decimal separator.
6. From the list box next to 'Digit grouping symbol:' select the symbol to be used as thousand separator.
7. Click **OK** to save the settings and to close the window.

A.2.2 Time stamped data

Measured and calculated data is accompanied with a time stamp with the same resolution as the time stamp configured in the CIU 880.

See section A.2.3 for more information about time resolutions.

A.2.3 Date and time presentation

A.2.3.1 Date

Dates are always presented in ISO format, i.e. YYYY-MM-DD, where:

- YYYY = the year (all digits)
- MM = the month (01 (January) to 12 (December))
- DD = the day (01 to 31)

For example, '3rd of October 2013' is presented as 2013-10-03.

A.2.3.2 Time

Times are presented in one of the following formats:

- Times in minutes resolution are presented as hh:mm
- Times in seconds resolution are presented as hh:mm:ss
- Times in milliseconds resolution are presented as hh:mm:ss.ttt

where:

- hh = zero-padded hour between 00 and 24
- mm = zero-padded minute between 00 and 59
- ss = zero-padded second between 00 and 60
- ttt = zero-padded between 000 and 999

A.3 List of entities not needing restart after a change

TABLE A-1

List of CIU 888 entities that do not require a restart after changing

Entity Name	Entity Number
TempElementType	8
ShellCapacity	17
LowTOV	18
HighTOV	19
VolumeCorrections	24
ProductTRef	26
ProductDref	30
SedAndWater	32
ProductTC	33
LiqVolRatio	35
WaterVol	56
MolarWeight	79
TankTRef	90
ThermalexpCoeffTankshell	91
TankAirDensity	92
AmbientTemperature	103
InsulationFactor	109
LowestTemperatureElement	110
CTL (VCF)	124

Entity Name	Entity Number
TCF	126
DCF	128
WaterDipOffset	2070
NegativeLevelsEnabled	2073
Moving TripValue	2100
MovingIntervalTime	2101
TankZoneControl	4003
TankZoneStart	4004
TankZoneEnd	4005
TankZoneCorrection	4006
FloMul	5042
FloIntervalTime	5043
GaugeDetail	6500
GSVCalcType	8122
ProductCode	8133
TRDTStartAddressOfTankIP	15006
TRDTLengthOfTankRecordIP	15008
TRDTScalingIP	15013
TRDTOffsetIP	15014
HostPortDeviceName	15016
HostPortProtocolType	15019
HostPortRTUaddress	15020
HostPortBaudRate	15022
HostPortStopBits	15024
HostPortParity	15025
HostPortTAD	15026
HostPortMSUMode	15049
HostPortGPUCache	15050

APPENDIX B SCANNING

The main task of the CIU 888 is scanning the connected tank gauging instruments continuously for the measured values of the connected devices.

B.1 Scanning Philosophy

CIU 888 incorporates time-based scanning for better scanning performance. CIU 888 maintains a scan items pool per field port / sequenced field ports that has the list of scan items to be scanned. Each scan item is allocated a minimum scan period and a maximum scan period. Minimum scan period is the minimum expected time interval at which the scan item must be scheduled in milliseconds and maximum scan period is maximum time interval within which the scan item must be scheduled in milliseconds.

Based on the scan periods and current scanning pattern of the scan items, CIU 888's scanning algorithm picks up the most useful item among all the scan items configured for a field port and sends it to the field. In case of sequenced field ports (channel sequencing), CIU 888's scanning algorithm picks up the most useful item among all the scan items configured for the field ports that are sequenced.

The following are the various scan items processed by CIU 888.

B.2 Configured Foreground scan items

The CIU 888 scans measurable data inputs (e.g. product level) that are configured in the foreground scan more often than data inputs configured in the background scan.

In tank gauging, the most important data to retrieve from gauging instruments on a tank is the level. The core competency of the scanner is to update each value on a regular basis. If tank calculation is part of the solution, a change of each new level value will trigger the calculations module to recalculate the tank record.

B.3 Configured Background scan items

Measured data inputs that do not change frequently, e.g. the average temperature of a tank, do not need to be scanned with the same scan rate as the values that are scanned in the foreground scan.

The CIU 888 scans all measurable data inputs that are configured in the foreground with a higher priority ((i.e) less minimum and maximum scan period) than the measurable data inputs that are configured in the background scan.

B.4 Command scan items

When gauge commands are issued from the Host system, gauge command scan items are added to the scan items pool. Gauge command scan items are scheduled with a higher priority ((i.e) less minimum and maximum scan period) than configured foreground and background items.

B.5 Service Messages

When service messages are issued from Service tools like Engauge, service messages are added to the scan items pool. Service messages are scheduled with a higher priority ((i.e) less minimum and maximum scan period) than configured foreground and background items.

Adaptive scanning based on field device communication failures:

1. Field device retries are made smarter and spread rather than configured consecutive retries.
2. If the communication errors are received for the configured number of retries for a field device, the priority of all the scan items for that field device will be reduced and retries are skipped until a valid response is received for that field device.
3. On receiving a valid response from the field, the priority of the field device is moved to the appropriate level and retry mechanism is restored.

B.6 Priority Agent

CIU 888 also incorporates a Priority Agent which monitors the product movement and product level close to Tank High limit and relatively prioritizes the scan items by modifying the minimum and maximum scan periods of the scan items so that critical parameters are scanned at a faster rate compared to the less critical parameters. Priority agent can be enabled / disabled with a configuration option.

Priority Agent is disabled - CIU 888 scans the field using a static time based scanning algorithm for foreground and background scan items. No priority changes happen based on Product movement and Tank High Monitoring Limit.

Priority Agent is enabled - CIU 888 scans the field using a dynamic time scanning algorithm based on the Product movement and Tank High monitoring limit. Scan item's priority changes happen based on Product movement and Tank High Monitoring Limit. That is, a relative prioritization is done between static tanks (tanks with no product movement), dynamic tanks (tanks with product movement), dynamic tanks in which product level is beyond the configured Tank high monitoring limit.

The following table provides various priority levels incorporated in CIU 888.

Priority	Scenario
Very High	Product level when it is close to Tank high limit (beyond the configured Tank high monitoring limit) and product movement is detected.
High	Service messages received over Service Ethernet port Command scan messages.
Above Normal	Product level when detected to be moving in a specific direction. Product level when it is close to Tank high limit and no product movement is detected Product level when it is close to Tank high limit, and device communication errors occur irrespective of product movement being detected / not.
Normal	Foreground parameters (e.g. Level) of static tanks i.e. no product movement is detected. Product level of tanks where it was moving when device communication errors occur, Service / emulation messages received over serial host ports.
Below Normal	Background parameters (e.g. Temperature, Density) Foreground parameters (e.g. Level) of static tanks when device communication errors occur.
Low	Background parameters of tanks when device communication errors occur.

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APPENDIX C REDUNDANCY

C.1 Sync Link and database synchronization

Redundancy between a pair of CIU 888s is realized by synchronizing the databases of the CIU 888s. Real-time and continuous synchronization ensures that all recently measured data is available to both CIU 888s and is required to minimize switch-over time.

To achieve real-time and continuous synchronization, a dedicated Ethernet connection between the pair of CIU 888s must be established, called the Sync Link. The Sync Link connection is also used to determine the actual role of each CIU 888 (active or passive). To establish the Sync Link connection, the CIU 888s have to be connected by means of a Cat. 5. Ethernet cable.

In a redundant CIU 888 system setup the following data stores are kept synchronized:

- Real-time data
- Active gauge commands, including status
- Configuration data
- Operational data (manual overwrites and gauge commands)
- Clock

NOTE: A failure in the Sync Link connection will disable synchronization.

The Sync Link port is located at the back of the CIU 888 (see FIGURE C-1).

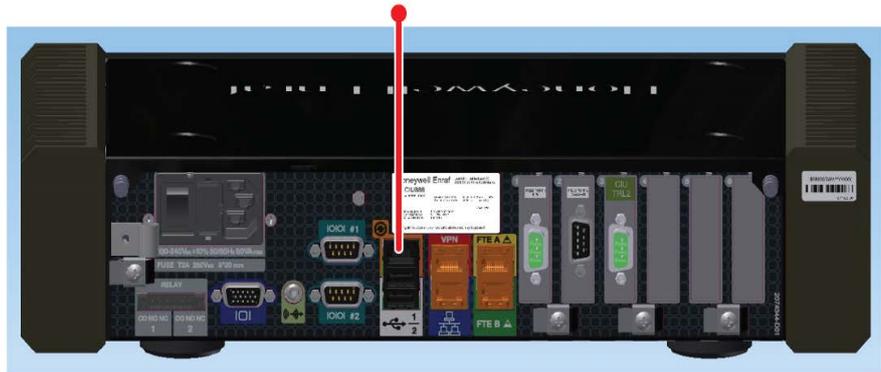


FIGURE C-1

CIU 888: Sync Link port

C.2 Supported redundant CIU 888 topologies of deployment

The following redundant CIU 888 topologies of deployment are supported:

- RS-232 host port redundancy with redundant CIU 888s and host port redundancy on demand of host system (see section C.2.1)
- RS-232 host port redundancy with redundant CIU 888s and data synchronization by host system (see section C.2.2)

C.2.1 RS-232 host port redundancy with redundant CIU 888s and host port redundancy on demand of host system

In this configuration, both CIU 888s in the redundant configuration are connected to the same host system, i.e. Entis Pro (see FIGURE C-2). The CIU 888s are connected to the host system via one of their fixed host ports. Each host port has its own unique RTU address and is configured for communication through Modbus RTU on serial.

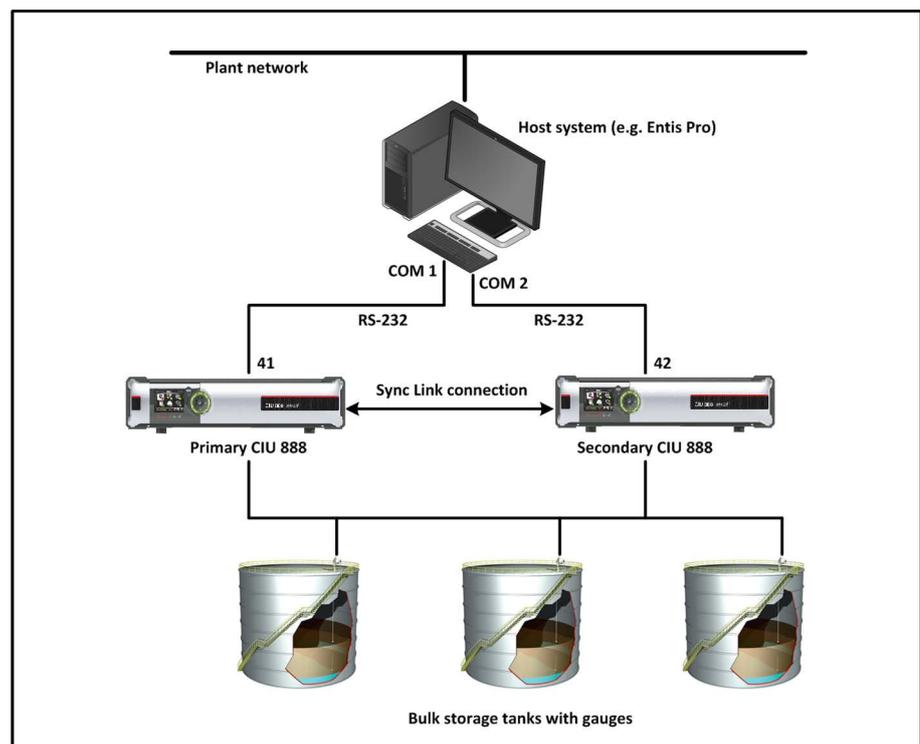


FIGURE C-2

RS-232 Host port redundancy with redundant CIU 888s and host port redundancy on demand of host system

This configuration is compliant with Entis Pro. By issuing the appropriate Modbus command, Entis Pro can demand to switch over to the secondary CIU 888 if the primary CIU 888 is not responding anymore and move to Com2/Port 42 to acquire tank data. The

secondary CIU 888 becomes the active CIU and its host port becomes R/W.

NOTE: Refer to the chapter 'CIU Plus Links' in the Configuration Manual Entis Pro 2.70x for Windows (Part No. 4416381) for more information about connecting the CIU 888 to the Entis Pro system.

C.2.2 RS-232 host port redundancy with redundant CIU 888s and data synchronization between host systems

In this configuration, each CIU 888 in the redundant configuration is connected to a separate host system, i.e. Entis Pro (see FIGURE C-3). The CIU 888s are connected to the host system via one of their fixed Host ports. Each host port has its own unique RTU address and is configured for communication through Modbus RTU on serial. By connecting each CIU 888 to a separate instance of Entis Pro, an extra safety is created in the event of failure of one of the two host systems.

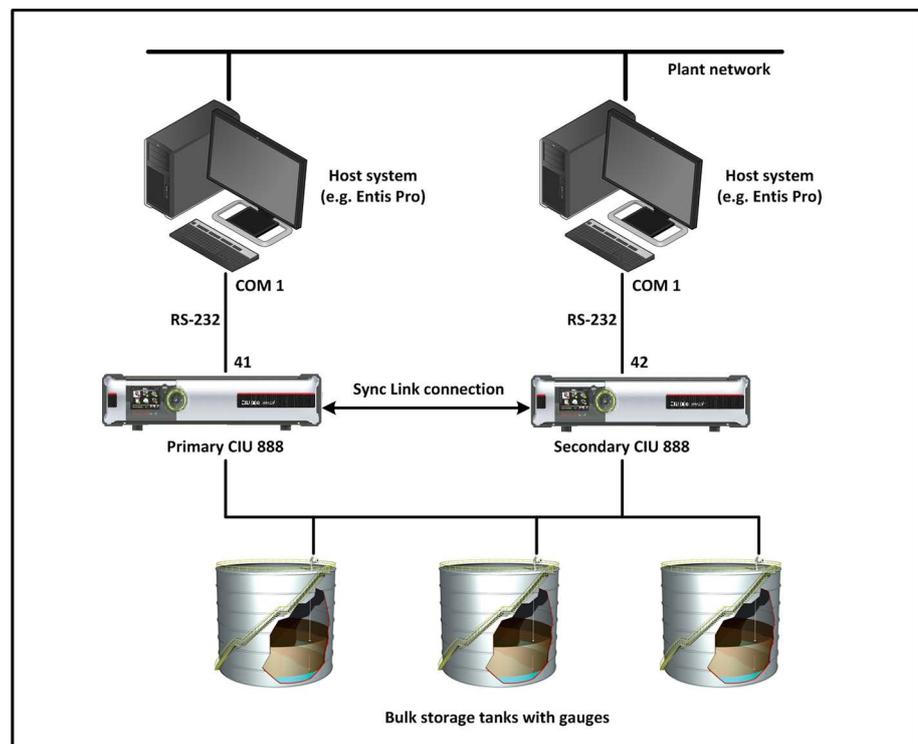


FIGURE C-3

RS-232 host port redundancy with redundant pair of CIU 888s and data synchronization between host systems

This configuration is compliant with Entis Pro. By issuing the appropriate Modbus command, Entis Pro can demand to switch over to the secondary CIU 888 if the primary CIU 888 is not responding anymore and move to Com2/Port 42 to acquire tank data. The secondary CIU 888 becomes the active CIU and its host port becomes R/W.

NOTE: Refer to the chapter 'CIU Plus Links' in the Configuration Manual Entis Pro 2.70x for Windows (Part No. 4416381) for more information about connecting the CIU 888 to the Entis Pro system.

APPENDIX D LIST OF ABBREVIATIONS

Abbreviation	Description
BPM	Bi-Phase Mark
CIU	Communication Interface Unit
DCS	Distributed Control System
GOV	Gross Observed Volume
GPU	Gauge Processing Unit
GSV	Gross Standard Volume
HTTP	Hypertext Transfer Protocol
PC	Personal Computer
PLC	Programmable Logic Controller
RAM	Random Access Memory
RTU	Remote Terminal Unit
SCADA	Supervisory Control And Data Acquisition
TOV	Total Observed Volume
W&M	Weights and Measures
XML	Extensible Markup Language

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For service-related questions, contact:

Technical Assistance Centre

Phone:

+1 800 423 9883 or

+1 215 641 3610

E-mail:

HFS-TAC-SUPPORT@honeywell.com

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Americas

Honeywell Enraf Americas, Inc.
1250 West Sam Houston Pkwy S.
Houston, TX 77042
USA
Phone: +1 (480) 293-2042
Email: enraf-us@honeywell.com

Asia Pacific

Honeywell Pte Ltd.
17 Changi Business Park Central 1
Singapore 486073
Phone: +65 6355 2828
Email: enraf-sg@honeywell.com

Europe, Middle East and Africa

Honeywell Enraf
Delftechpark 39
2628 XJ Delft the Netherlands
Phone: +31 (0)15 2701 100
Email: enraf-nl@honeywell.com

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