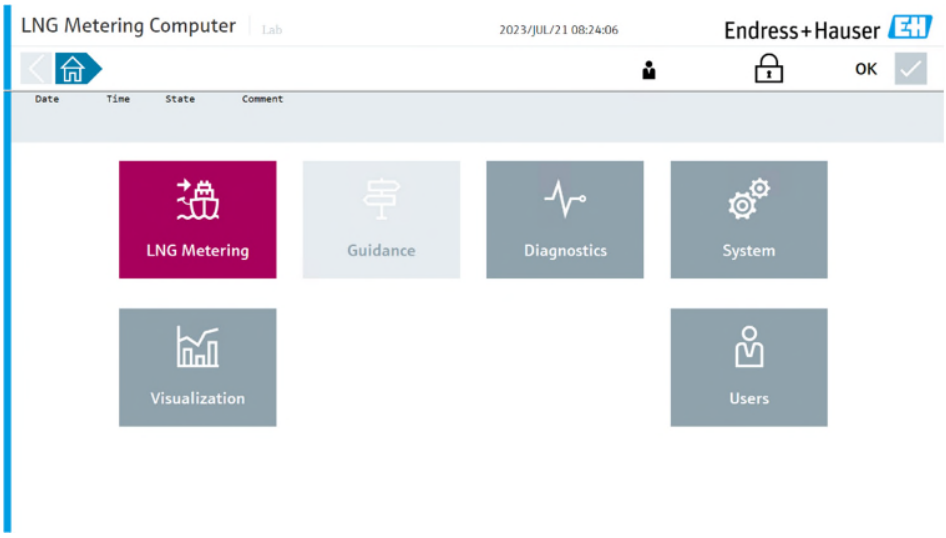
SD02946D/06/EN/01.23-00
71632193
2023-10-31
Valid as of version
02.01.00 (Device firmware)

Special Documentation
LNG Metering Computer

Data Interface Description

Modbus TCP & OPC-UA



Endress+Hauser
People for Process Automation

Version History

Date	Version	Change
01.03.2023	01.00	Initial version
16.03.2023	01.01	Added Fuel Gas Measurement information
14.06.2023	01.02	Added Fuel Gas diagnostic information
18.07.2023	01.03	Alternative data types for 64-bit floating point
13.10.2023	01.04	Additional Modbus protocol specifications

Table of Contents

1 Document Information

1.1 Purpose

The purpose of this document is to specify the data interface between the LNG Metering Computer and a third-party system (for example a customer supervisory system).

1.2 Acronyms and Abbreviations

LNGMC	LNG Metering Computer
BOG	Boil-off gas
MN	Methane Number
FWA	Flow-weighted average

1.3 Intended audience

The target audience of this manual are software programmer implementing the Modbus TCP or OPC-UA interface to the LNG Metering Computer.

1.4 Applicable versions

This manual applies to the following LNG Metering Computer software versions:

Component	Version
HMI software version	02.00.00 or newer

2 IP Address Configuration

ETH2 Ethernet interface is used to connect to external systems. The IP configuration can be freely configured according to customer requirements.

2.1 Default IP settings

IP Address:	DHCP
Subnet mask:	DHCP

3 Modbus TCP

3.1 Definitions

The LNGMC acts as the Modbus server (slave), the third-party system as the client (master).
Register addresses specified in this document are **1-based according to the Modbus data model**.

For more details on Modbus, please visit the official Modbus specification via the following link:
https://modbus.org/specs.php

3.2 Settings

TCP port:	**502**
Modbus Slave Address:	**2**

3.3 Modbus function codes

The following Modbus function codes are supported:

Function code	Function name	Description
04	Read Input Registers (3xxxx)	Read 1-125 contiguous registers
06	Write Single Register (4xxxx)	Write 1 register

3.4 Byte order

The Modbus byte order is **little endian**.

3.5 Word order

For 32-bit and 64-bit values, the **first word is low**.

4 OPC-UA

4.1 Settings

TCP port:	49321

4.2 Security

4.2.1 Supported security policies

Basic256Sha256	Sign and Encrypt

4.2.2 Login

Username	Password
lngmc-opcua	hCgrjuSEGkvLsv

Endress+Hauser can generate a new password on request.

5 Parameter Specification

The available parameters are categorized as follows:

Process values	Current process values for the LNG & BOG line
Totalizer	Current non-resettable totalizers for the LNG & BOG line
Current operation	Operation-specific values for the current running operation (if an operation is currently running)
Previous operation	Operation-specific values for the previously closed operation. These values can be used for BTD data collection.
Diagnostic values	Diagnostic data for the complete system
Units	Current measurement units
Fuel Gas measurement	Current process values for the optional Fuel Gas measurement.

Depending on the installed options, not all values are available:

No BOG meter installed:	BOG values not available
No Raman analyzer installed:	Energy values, calorific values, LNG composition & methane number values not available
No Fuel Gas meter installed:	Fuel Gas process values not available

5.1 Process values

5.1.1 Flow Rate F1 (LNG & BOG)		Current mass flow rate. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30201** **BOG: 30301**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t/h**

5.1.2 Pressure P1 (LNG & BOG)		Current pressure. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30203** **BOG: 30303**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **Bar(a)**

5.1.3 Temperature T1 (LNG & BOG)		Current temperature. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30205** **BOG: 30305**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **°C**

5.1.4 Density At Reference Conditions (LNG)		Current LNG density at reference conditions (e.g. @ 15 °C, 1.01325 Bar(a)). ➔ Only available if Raman analyzer installed.
Modbus register:	**30207**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.1.5 Density At Process Conditions (LNG)		Current LNG density at current process conditions. ➔ Only available if Raman analyzer installed.
Modbus register:	**30209**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.1.6 Methane (LNG)		Current LNG relative Methane content. ➔ Only available if Raman analyzer installed.
Modbus register:	**30211**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.1.7 Ethane (LNG)	
Modbus register:	**30213**
Register count:	**2**
Data type:	**Float (32-bit)**
Access:	**Read only**
Software version:	**02.00.00 and newer**

Current LNG relative Ethane content.

➔ Only available if Raman analyzer installed.

Unit: **mol%**

5.1.8 Propane (LNG)	
Modbus register:	**30215**
Register count:	**2**
Data type:	**Float (32-bit)**
Access:	**Read only**
Software version:	**02.00.00 and newer**

Current LNG relative Propane content.

➔ Only available if Raman analyzer installed.

Unit: **mol%**

5.1.9 i-Butane (LNG)	
Modbus register:	**30217**
Register count:	**2**
Data type:	**Float (32-bit)**
Access:	**Read only**
Software version:	**02.00.00 and newer**

Current LNG relative i-Butane content.

➔ Only available if Raman analyzer installed.

Unit: **mol%**

5.1.10 n-Butane (LNG)	
Modbus register:	**30219**
Register count:	**2**
Data type:	**Float (32-bit)**
Access:	**Read only**
Software version:	**02.00.00 and newer**

Current LNG relative n-Butane content.

➔ Only available if Raman analyzer installed.

Unit: **mol%**

5.1.11 i-Pentane (LNG)		Current LNG relative i-Pentane content. ➔ Only available if Raman analyzer installed.
Modbus register:	**30221**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.1.12 n-Pentane (LNG)		Current LNG relative n-Pentane content. ➔ Only available if Raman analyzer installed.
Modbus register:	**30223**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.1.13 Nitrogen (LNG)		Current LNG relative Nitrogen content. ➔ Only available if Raman analyzer installed.
Modbus register:	**30225**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.1.14 Gross Calorific Value (LNG)		Current LNG Gross Calorific Value. ➔ Only available if Raman analyzer installed.
Modbus register:	**30227**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.1.15 Net Calorific Value (LNG)		Current LNG Net Calorific Value. ➔ Only available if Raman analyzer installed.
Modbus register:	**30229**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.1.16 Gross Wobbe Index (LNG)		Current LNG Gross Wobbe Index. ➔ Only available if Raman analyzer installed.
Modbus register:	**30231**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.1.17 Net Wobbe Index (LNG)		Current LNG Net Wobbe Index. ➔ Only available if Raman analyzer installed.
Modbus register:	**30233**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.1.18 MN AVL (LNG)		Current LNG Methane Number AVL. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30235**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.1.19 MN CARB (LNG)		Current LNG Methane Number CARB. ➔ Only available if Raman analyzer installed.
Modbus register:	**30237**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.1.20 MN PKI (LNG)		Current LNG Methane Number PKI. ➔ Only available if Raman analyzer installed.
Modbus register:	**30239**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.1.21 MN ISO 15403 L/C (LNG)		Current LNG Methane Number ISO 15403 L/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30241**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.1.22 MN ISO 15403 H/C (LNG)		Current LNG Methane Number ISO 15403 H/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30243**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.1.23 MN MWM (LNG)		Current LNG Methane Number MWM. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30245**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.2 Totalizer

5.2.1 Mass Delivery Totalizer (LNG)		LNG mass non-resettable totalizer delivery direction.
Modbus register:	**30120**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.2.2 Mass Loading Totalizer (LNG)		LNG mass non-resettable totalizer loading direction.
Modbus register:	**30124**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.2.3 Mass Delivery Totalizer (BOG)		BOG mass non-resettable totalizer delivery direction. ➔ BOG: Only available if BOG line installed.
Modbus register:	**30128**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.2.4 Mass Loading Totalizer (BOG)		BOG mass non-resettable totalizer loading direction. ➔ BOG: Only available if BOG line installed.
Modbus register:	**30132**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.3 Current operation

5.3.1 Operation Status		0 = No operation active 1 = Operation active
Modbus register:	**30001**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.3.2 Operation Number		Operation number for the current running operation.
Modbus register:	**30002**	
Register count:	**2**	
Data type:	**Unsigned Integer (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.3.3 Operation Start Date/Time		Operation Start date & time for the current running operation.
Modbus register:	**30004**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.3.4 Operation End Date/Time		Operation End date & time for the current running operation.
Modbus register:	**30014**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.3.5 Error During Operation		Indicates whether an error occurred during the current running operation. 0 = No error occurred 1 = Error occured
Modbus register:	**30024**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.6 Totalizer Mass (LNG & BOG)		Current mass totalizer (Loading-Delivery) for the current running operation. ➔ BOG: Only available if BOG line installed. Alternative data type: 5.8.2 Totalizer Mass (LNG & BOG)
Modbus register:	**LNG: 30025** **BOG: 30033**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **T**

5.3.7 Totalizer Energy (LNG & BOG)		Current energy totalizer (Loading-Delivery) for the current running operation. ➔ Only available if Raman analyzer installed. ➔ BOG: Only available if BOG line installed. Alternative data type: 5.8.3 Totalizer Energy (LNG & BOG)
Modbus register:	**LNG: 30029** **BOG: 30037**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.3.8 Totalizer Mass Net		Current net mass totalizer (LNG-BOG) for the current running operation. Alternative data type: 5.8.4 Totalizer Mass Net
Modbus register:	**LNG: 30041**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.3.9 Totalizer Energy Net		Current net energy totalizer (LNG-BOG) for the current running operation. ➔ Only available if Raman analyzer installed. Alternative data type: 5.8.5 Totalizer Energy Net
Modbus register:	**LNG: 30045**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.3.10 Selected Transfer Point		Name of the selected transfer point for the current running operation.
Modbus register:	**LNG: 30049**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.11 Vessel or Terminal Name		Name of the vessel or terminal the current operation is transferring to/from for the current running operation.
Modbus register:	**LNG: 30059**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.12 Use BOG This Operation		Indicates whether the BOG line is used for the current running operation. 0 = BOG not used 1 = BOG used ➔ Only available if BOG line installed.
Modbus register:	**LNG: 30069**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.13 BOG Manual Gross Calorific Value		Manually entered (via HMI) BOG Gross Calorific Value. This value is used to calculate energy for the BOG line. ➔ Only available if BOG line installed.
Modbus register:	**LNG: 30070**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.3.14 FWA Temperature T1 (LNG & BOG)		Flow-weighted average value Temperature T1 for the current running operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30072** **BOG: 30076**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **°C**

5.3.15 FWA Pressure P1 (LNG & BOG)		Flow-weighted average value Pressure P1 for the current running operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30074** **BOG: 30078**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **Bar(a)**

5.3.16 LNG FWA Methane		Flow-weighted average value Methane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30080**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.17 LNG FWA Ethane		Flow-weighted average value Ethane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30082**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.18 LNG FWA Propane		Flow-weighted average value Propane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30084**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.19 LNG FWA i-Butane		Flow-weighted average value i-Butane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30086**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.20 LNG FWA n-Butane		Flow-weighted average value n-Butane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30088**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.21 LNG FWA i-Pentane		Flow-weighted average value i-Pentane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30090**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.22 LNG FWA n-Pentane		Flow-weighted average value n-Pentane for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30092**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.23 LNG FWA Nitrogen		Flow-weighted average value Nitrogen for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30094**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.3.24 LNG FWA Gross Calorific Value		Flow-weighted average value Gross Calorific Value for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30096**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.3.25 LNG FWA Net Calorific Value		Flow-weighted average value Net Calorific Value for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30098**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.3.26 LNG FWA Gross Wobbe Index		Flow-weighted average value Gross Wobbe Index for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30100**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.3.27 LNG FWA Net Wobbe Index		Flow-weighted average value Net Wobbe Index for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30102**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.3.28 LNG FWA Density at Reference Conditions		Flow-weighted average value Density at Reference Conditions for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30104**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.3.29 LNG FWA Density at Process Conditions		Flow-weighted average value Density at Process Conditions for the LNG line for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30106**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.3.30 FWA MN AVL (LNG)		Current flow-weighted average LNG Methane Number AVL. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30108**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.31 FWA MN CARB (LNG)		Current flow-weighted average LNG Methane Number CARB. ➔ Only available if Raman analyzer installed.
Modbus register:	**30110**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.32 FWA MN PKI (LNG)		Current flow-weighted average LNG Methane Number PKI. ➔ Only available if Raman analyzer installed.
Modbus register:	**30112**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.33 FWA MN ISO 15403 L/C (LNG)		Current flow-weighted average LNG Methane Number ISO 15403 L/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30114**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.34 FWA MN ISO 15403 H/C (LNG)		Current flow-weighted average LNG Methane Number ISO 15403 H/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30116**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.3.35 FWA MN MWM (LNG)		Current flow-weighted average LNG Methane Number MWM. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30118**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4 Previous operation

5.4.1 Operation Number		Operation number for the previous operation.
Modbus register:	**30601**	
Register count:	**2**	
Data type:	**Unsigned Integer (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.2 Operation Type		Operation type for the previous operation: 1 = Delivery operation 2 = Loading operation
Modbus register:	**30603**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.3 Selected Transfer Point		Name of the selected transfer point for the previous operation.
Modbus register:	**LNG: 30604**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.4 Correction Volume		Correction volume for the previous operation (based on the selected transfer point).
Modbus register:	**LNG: 30614**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **m^3**

5.4.5 Use BOG This Operation		Indicates whether the BOG line is used for the previous operation. 0 = BOG not used 1 = BOG used ➔ Only available if BOG line installed.
Modbus register:	**LNG: 30616**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.6 Operation Start Date/Time		Operation Start date & time for the previous operation.
Modbus register:	**30617**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.7 Operation End Date/Time		Operation End date & time for the previous operation.
Modbus register:	**30627**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.8 Error During Operation		Indicates whether an error occurred during the previous operation. 0 = No error occurred 1 = Error occured
Modbus register:	**30637**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.9 Mass Totalizer Delivery Start (LNG & BOG)		Non-resettable mass totalizer delivery at operation start for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30638** **BOG: 30662**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.10 Mass Totalizer Loading Start (LNG & BOG)		Non-resettable mass totalizer loading at operation start for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30642** **BOG: 30666**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.11 Mass Totalizer Delivery End (LNG & BOG)		Non-resettable mass totalizer delivery at operation end for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30646** **BOG: 30670**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.12 Mass Totalizer Loading End (LNG & BOG)		Non-resettable mass totalizer loading at operation end for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30650** **BOG: 30674**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.13 Mass Transferred (LNG & BOG)		Mass transferred for the previous operation. ➔ BOG: Only available if BOG line installed. Alternative data type: 5.8.7 Mass Transferred (LNG & BOG)
Modbus register:	**LNG: 30654** **BOG: 30678**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.14 LNG Mass Transferred Corrected		LNG mass transferred (corrected by the correction volume depending on the selected transfer point) for the previous operation. Alternative data type: 5.8.8 LNG Mass Transferred Corrected
Modbus register:	**LNG: 30658**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.4.15 Energy Transferred (LNG & BOG)		Energy transferred for the previous operation. ➔ BOG: Only available if BOG line installed. ➔ Only available if Raman analyzer installed. Alternative data type: 5.8.9 Energy Transferred (LNG & BOG)
Modbus register:	**LNG: 30682** **BOG: 30686**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.4.16 Net Transferred Energy		Energy transferred (LNG-BOG) for the previous operation.
Modbus register:	**LNG: 30690**	
Register count:	**4**	
Data type:	**Float (64-bit)**	Alternative data type: 5.8.10 Net Transferred Energy
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.4.17 Net Transferred Energy Corrected		Energy transferred (LNG-BOG, corrected by the correction volume depending on the selected transfer point) for the previous operation.
Modbus register:	**LNG: 30694**	
Register count:	**4**	
Data type:	**Float (64-bit)**	Alternative data type: 5.8.11 Net Transferred Energy Corrected
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.4.18 FWA Temperature T1 (LNG & BOG)		Flow-weighted average value Temperature T1 for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30698** **BOG: 30702**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **°C**

5.4.19 FWA Pressure P1 (LNG & BOG)		Flow-weighted average value Pressure P1 for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30700** **BOG: 30704**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **Bar(a)**

5.4.20 LNG FWA Methane		Flow-weighted average value Methane for the LNG line for the previous operation.
Modbus register:	**LNG: 30706**	

Register count:	**2**	➔ Only available if Raman analyzer installed.
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.21 LNG FWA Ethane		Flow-weighted average value Ethane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30708**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.22 LNG FWA Propane		Flow-weighted average value Propane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30710**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.23 LNG FWA i-Butane		Flow-weighted average value i-Butane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30712**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.24 LNG FWA n-Butane		Flow-weighted average value n-Butane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30714**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.25 LNG FWA i-Pentane		Flow-weighted average value i-Pentane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30716**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.26 LNG FWA n-Pentane		Flow-weighted average value n-Pentane for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30718**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.27 LNG FWA Nitrogen		Flow-weighted average value Nitrogen for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30720**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **mol%**

5.4.28 LNG FWA Gross Calorific Value		Flow-weighted average value Gross Calorific Value for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30722**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.4.29 LNG FWA Net Calorific Value		Flow-weighted average value Net Calorific Value for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30724**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.4.30 LNG FWA Gross Wobbe Index		Flow-weighted average value Gross Wobbe Index for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30726**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.4.31 LNG FWA Net Wobbe Index		Flow-weighted average value Net Wobbe Index for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30728**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/m³**

5.4.32 LNG FWA Density at Reference Conditions		Flow-weighted average value Density at Reference Conditions for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30730**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.4.33 LNG FWA Density at Process Conditions		Flow-weighted average value Density at Process Conditions for the LNG line for the previous operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30732**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **kg/m³**

5.4.34 FWA MN AVL (LNG)		Current flow-weighted average LNG Methane Number AVL. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30734**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.35 FWA MN CARB (LNG)		Current flow-weighted average LNG Methane Number CARB. ➔ Only available if Raman analyzer installed.
Modbus register:	**30736**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.36 FWA MN PKI (LNG)		Current flow-weighted average LNG Methane Number PKI. ➔ Only available if Raman analyzer installed.
Modbus register:	**30738**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.37 FWA MN ISO 15403 L/C (LNG)		Current flow-weighted average LNG Methane Number ISO 15403 L/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30740**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.38 FWA MN ISO 15403 H/C (LNG)		Current flow-weighted average LNG Methane Number ISO 15403 H/C. ➔ Only available if Raman analyzer installed.
Modbus register:	**30742**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.39 FWA MN MWM (LNG)		Current flow-weighted average LNG Methane Number MWM. ➔ Only available if Raman analyzer installed. ➔ Only available if extended Methane Number calculation active.
Modbus register:	**30744**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.4.40 BOG Manual Gross Calorific Value		Manually entered (via HMI) BOG Gross Calorific Value. This value is used to calculate energy for the BOG line. ➔ Only available if BOG line installed.
Modbus register:	**LNG: 30746**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **MJ/kg**

5.4.41 Vessel or Terminal Name		Name of the vessel or terminal the current operation is transferring to/from for the previous operation.
Modbus register:	**LNG: 30748**	
Register count:	**10**	
Data type:	**String (20 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.5 Diagnostic values

5.5.1 LNGMC Heartbeat		Heartbeat value from the LNG Metering Computer. This value will count every second indicating that the LNG Metering Computer is up & running. It is recommended to always check this value.
Modbus register:	**LNG: 30501**	
Register count:	**2**	
Data type:	**Unsigned Integer (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.5.2 Overall System Status		Overall system status: 0 = ERROR (at least one alarm with status ERROR currently active) 1 = WARNING (no alarm with status ERROR active, at least one alarm with status WARNING active) 2 = OK (no alarms active)
Modbus register:	**LNG: 30503**	
Register count:	**1**	
Data type:	**Unsigned Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.5.3 Alarms Error Array		Global alarms (status ERROR) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30504**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.5.4 Alarms Warning Array		Global alarms (status WARNING) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30506**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.5.5 Flow Computer 1 Alarms Error Array		Flow Computer 1 (LNG) alarms (status ERROR) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30508**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.5.6 Flow Computer 1 Alarms Warning Array		Flow Computer 1 (LNG) alarms (status WARNING) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30510**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.5.7 Flow Computer 2 Alarms Error Array		Flow Computer 2 (BOG) alarms (status ERROR) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30512**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.5.8 Flow Computer 2 Alarms Warning Array		Flow Computer 2 (BOG) alarms (status WARNING) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 30514**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **-**

5.6 Units

5.6.1 Unit Calorific Value (LNG & BOG)		Unit for Calorific values, represented as a string value.
Modbus register:	**LNG: 30901** **BOG: 30929**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.2 Unit Density (LNG & BOG)		Unit for Density values, represented as a string value.
Modbus register:	**LNG: 30905** **BOG: 30933**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.3 Unit Energy (LNG & BOG)		Unit for Energy values, represented as a string value.
Modbus register:	**LNG: 30909** **BOG: 30937**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.4 Unit Mass (LNG & BOG)		Unit for Mass values, represented as a string value.
Modbus register:	**LNG: 30913** **BOG: 30941**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.5 Unit Mass Flow (LNG & BOG)		Unit for Mass Flow values, represented as a string value.
Modbus register:	**LNG: 30917** **BOG: 30945**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.6 Unit Pressure (LNG & BOG)		Unit for Pressure values, represented as a string value.
Modbus register:	**LNG: 30921** **BOG: 30949**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.6.7 Unit Temperature (LNG & BOG)		Unit for Temperature values, represented as a string value.
Modbus register:	**LNG: 30925** **BOG: 30953**	
Register count:	**4**	
Data type:	**String (8 bytes)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.7 Fuel Gas Measurement

5.7.1 Mass Flow Rate (Fuel Gas)		Current mass flow rate based on pulse inputs from the Promass.
Modbus register:	**LNG: 31001**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t/h**

5.7.2 Totalizer Mass FWD (Fuel Gas)		Current mass totalizer forward flow direction since last totalizer reset, based on pulse inputs from the Promass.
Modbus register:	**LNG: 31003**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t**

5.7.3 Totalizer Mass REV (Fuel Gas)		Current mass totalizer reverse flow direction since last totalizer reset, based on pulse inputs from the Promass.
Modbus register:	**LNG: 31007**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t**

5.7.4 Totalizer Mass NET (Fuel Gas)		Current mass net totalizer (forward-reverse) since last totalizer reset, based on pulse inputs from the Promass.
Modbus register:	**LNG: 31011**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t**

5.7.5 Non-resettable Totalizer Mass FWD (Fuel Gas)		Non-resettable mass totalizer forward flow direction, based on pulse inputs from the Promass.
Modbus register:	**LNG: 31015**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t**

5.7.6 Non-resettable Totalizer Mass REV (Fuel Gas)		Non-resettable mass totalizer reverse flow direction, based on pulse inputs from the Promass.
Modbus register:	**LNG: 31019**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t**

5.7.7 Pressure (Fuel Gas)		Current pressure.
Modbus register:	**LNG: 31023**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **Bar(a)**

5.7.8 Temperature (Fuel Gas)		Current temperature.
Modbus register:	**LNG: 31025**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **°C**

5.7.9 Promass Mass Flow Rate (Fuel Gas)		Current mass flow rate based on Modbus input from Promass.
Modbus register:	**LNG: 31027**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **t/h**

5.7.10 Promass Density (Fuel Gas)		Current flowing density based on Modbus input from Promass.
Modbus register:	**LNG: 31029**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **kg/m³**

5.7.11 Promass Temperature (Fuel Gas)		Current Promass temperature based on Modbus input from Promass.
Modbus register:	**LNG: 31031**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **°C**

5.7.12 Promass Status		Current Promass status (see Promass product manual for details).
Modbus register:	**31033**	
Register count:	**2**	
Data type:	**Signed Integer (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: **-**

5.7.13 Totalizer Last Reset Date Time (Fuel Gas)		Date and time for the latest mass totalizer reset. The date and time is transferred as a 64-bit float value and interpreted as DATE value. For more information on DATE values see the following link: https://learn.microsoft.com/en-us/previous-versions/visualstudio/visual-studio-2008/82ab7w69(v=vs.90)?redirectedfrom=MSDN
Modbus register:	**31035**	
Register count:	**4**	
Data type:	**Float (64-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: -

5.7.14 Flow Computer 3 Alarms Warning Array		Flow Computer 3 (Fuel Gas) alarms (status WARNING) overview, presented as array of bits. 0 = Alarm not active 1 = Alarm active See User Manual for bit assignment.
Modbus register:	**LNG: 31039**	
Register count:	**2**	
Data type:	**Bit array (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: -

5.7.15 Totalizer Reset Command (Fuel Gas)		Setting this value to 1 will reset the mass totalizer to 0. The value will automatically set back to 0 once the command is executed.
Modbus register:	**41001**	
Register count:	**1**	
Data type:	**Signed Integer (16-bit)**	
Access:	**Read only**	
Software version:	**02.01.00 and newer**	Unit: -

5.8 Alternative Data Types

The following Modbus registers are alternatives to Modbus registers specified in earlier chapters within this document. These Modbus registers should provide compatibility for systems unable to process 64-bit values.

5.8.1 Current operation

5.8.2 Totalizer Mass (LNG & BOG)		Current mass totalizer (Loading-Delivery) for the current running operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30136** **BOG: 30140**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.01 and newer**	Unit: **t**

5.8.3 Totalizer Energy (LNG & BOG)		Current energy totalizer (Loading-Delivery) for the current running operation. ➔ Only available if Raman analyzer installed. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30138** **BOG: 30142**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.01 and newer**	Unit: **GJ**

5.8.4 Totalizer Mass Net		Current net mass totalizer (LNG-BOG) for the current running operation.
Modbus register:	**LNG: 30144**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.01 and newer**	Unit: **t**

5.8.5 Totalizer Energy Net		Current net energy totalizer (LNG-BOG) for the current running operation. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30146**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.01.01 and newer**	Unit: **GJ**

5.8.6 Previous operation

5.8.7 Mass Transferred (LNG & BOG)		Mass transferred for the previous operation. ➔ BOG: Only available if BOG line installed.
Modbus register:	**LNG: 30758** **BOG: 30762**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.8.8 LNG Mass Transferred Corrected		LNG mass transferred (corrected by the correction volume depending on the selected transfer point) for the previous operation.
Modbus register:	**LNG: 30760**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **t**

5.8.9 Energy Transferred (LNG & BOG)		Energy transferred for the previous operation. ➔ BOG: Only available if BOG line installed. ➔ Only available if Raman analyzer installed.
Modbus register:	**LNG: 30764** **BOG: 30766**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.8.10 Net Transferred Energy		Energy transferred (LNG-BOG) for the previous operation.
Modbus register:	**LNG: 30768**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**

5.8.11 Net Transferred Energy Corrected		Energy transferred (LNG-BOG, corrected by the correction volume depending on the selected transfer point) for the previous operation.
Modbus register:	**LNG: 30770**	
Register count:	**2**	
Data type:	**Float (32-bit)**	
Access:	**Read only**	
Software version:	**02.00.00 and newer**	Unit: **GJ**