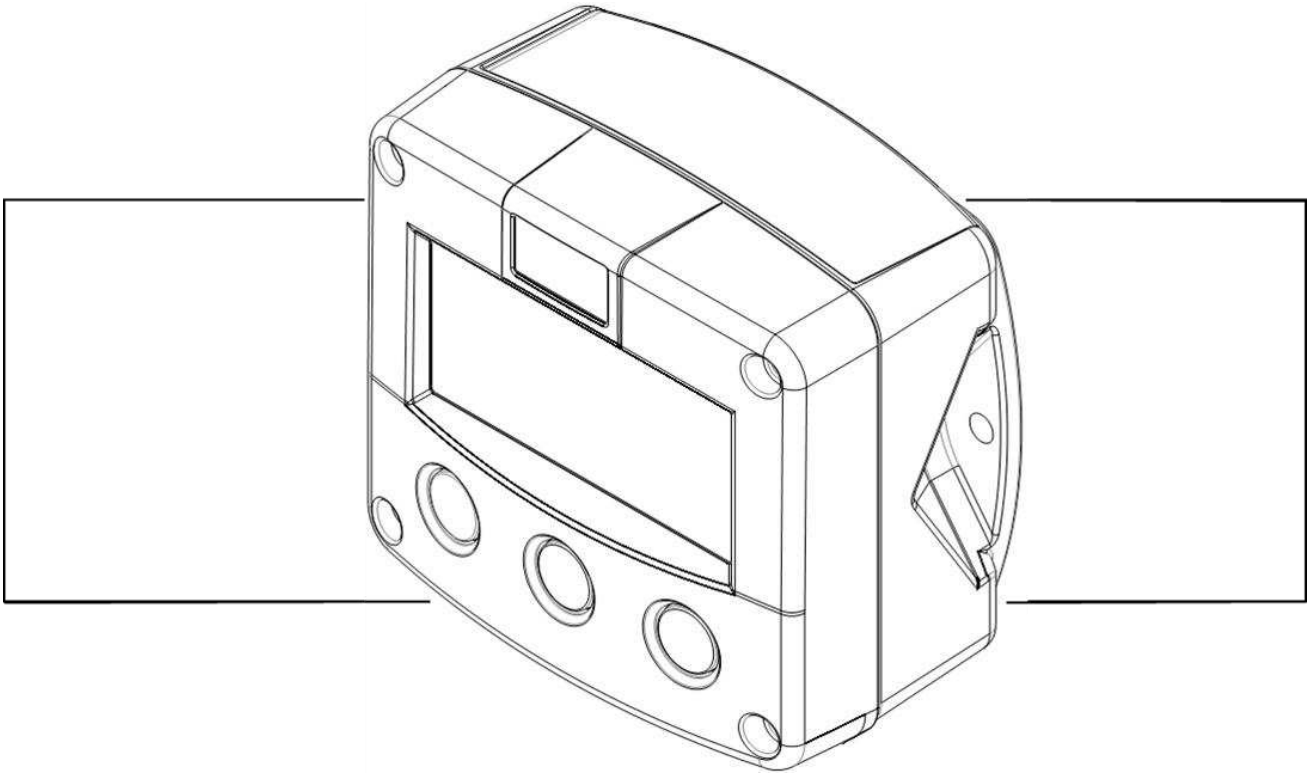
F1-Series

Flow rate indicator / Totalizer



Instruction Guide

Type ZU: Selectable MODBUS table

NOTICE	This Instruction Guide is meant as a quick reference document and is an addendum to the documentation set that came with the F1-Series. This Instruction Guide assumes that the F1-Series is installed in the field.

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Certifications

The allowed use of the F1-Series in hazardous area is determined by the applicable certification authority and is specified on the certification label which is attached to the housing. Please refer to the documentation set that came with the F1-Series for more information.

Revision history

VERSION	DESCRIPTION	DATE
001	Initial release based on E1 revision 004.	29 October 2020

TABLE OF CONTENTS

1 GENERAL INFORMATION

When the F1-Series, Flow rate indicator / Totalizer is ordered with type ZU, the following functionality is added to the F1-Series:

- Selectable Modbus Table

1.1 SETUP LEVEL MENU STRUCTURE

With type ZU, the following highlighted sub-functions are added to the SETUP level menu:

NOTICE	The additional settings are accessed through the SETUP level. As a result of different options installed throughout the F1-Series, the menu function group can vary and should be looked up in the menu based on its name, e.g. COM-MODB or COMMUNIC. Throughout this instruction guide, the function group number 9 is used.

COM-MODB MENU		SETTING	DEFAULT
9.1	SPEED (BAUDRATE)	1200 – 2400 – 4800 – 9600 – 9600 HP – 19200 – 38400	9600
9.2	ADDRESS	0 – 251 (0 = Disabled)	1
9.3	MODE	OFF – RTU – ASCII	RTU
9.4	DATABITS	8 bits – 7 bits	8 bits
9.5	PARITY	none – even - odd	None
9.6	TABLE	standard – type ZU	type ZU

2 SELECTABLE MODBUS TABLE

2.1 GENERAL

In many existing installations, the Modbus communication is based on a commonly used list of Modbus registers, which we have grouped in the Modbus 'type ZU' table. Since the 'type ZU' table is not compatible with our standard table, a selection must be made between these two tables at SETUP 9.6.

NOTICE	Selecting a different Modbus table at SETUP 9.6 does not influence your communication settings: speed, address, mode, databits and parity remain the same. Regardless of your Modbus table selection, you can always communicate with the F1-Series via our Remote Configuration Program. Reading runtime values, viewing and modifying settings as well as reading log data is not influenced by this setting.

2.2 TABLE 'STANDARD': ADDITIONAL REGISTERS

To use the standard table, select 'standard' at SETUP 9.6.

The available definitions, functions and registers can be reviewed in Appendix C – Modbus Communication in the User Manual in the documentation set that came with the F1-Series.

2.2.1 MODBUS TABLE

Modbus							
PDU ADDRESS	HOLDING REGISTER	VARIABLE	NO. REGISTERS	ACCESS	TYPE	VALUE / REMARKS	
[d] 1275 [h] 0x4FB	41276	Modbus Table	1	R/W	uint16	0 = standard	1 = type ZU

2.3 TABLE 'TYPE ZU': FUNCTION CODES AND DEFINITIONS

To use the 'type ZU' table, select 'type ZU' at SETUP 9.6. The following paragraphs describe the functions and registers that are available when this table is selected.

2.3.1 FUNCTION CODES

The following function codes supported are by the type ZU table:

Function code 3	"Read Holding Registers" (4x references)
Function code 16	"Preset Multiple Registers" (4x references)

2.3.2 MAP BLOCKS

The following blocks with Modbus holding registers are available:

REGISTER ADDRESS RANGE	FUNCTION	ENDIANNESS	SIZE
550 – 557	16-bit holding registers	Least significant word first	8 x 2 = 16 bytes
1000 – 1016	16-bit holding registers	Most significant word first	17 x 2 = 34 bytes
1200 – 1205	16-bit holding registers	Most significant word first	6 x 2 = 12 bytes
7000 – 7040	32-bit holding registers	Most significant word first	41 x 4 = 164 bytes
8000 – 8081	16-bit holding registers	Most significant word first	82 x 2 = 164 bytes
17001 – 17082	16-bit holding registers	Most significant word first	82 x 2 = 164 bytes

2.3.3 DATA TYPES

The following datatypes are used for Modbus communication:

U16	16 bits unsigned integer
FP	32 bits floating point; read through 2x 16 bit registers
FP32	32 bits floating point; read through 1x 32 bit register

2.3.4 REGISTER ORDER

The following register orders are used for Modbus communication:

Std	most significant word first
Rev	least significant word first

2.3.5 BAUD RATE AND POWER MODE

The following values are used for register 1010 (Baud Rate) and register 1007 (Power Mode):

REGISTER VALUE [REG 1010]	BAUD RATE	POWER MODE [REG 1007]
0 **	300	1 = Low Power
1 **	600	
2	1200	
3	2400	
4	4800	
5	9600	
5	9600	0 = High Power
6	19200	
7	38400	
8 **	57600	
10 **	115200	

**: The settings for 300, 600, 57600 and 115200 baud are not supported by the F1-Series and will be ignored.

2.4 TABLE 'TYPE ZU': REGISTERS

2.4.1 MODBUS TABLE

DESCRIPTION	REGISTER	SIZE	TYPE	RANGE	ACCESS	DEFAULT	REMARKS
Table	1275	16 bits	U16	0 – 1	R/W	1	0 = standard 1 = type ZU

2.4.2 SYSTEM CONFIGURATION

DESCRIPTION	REGISTER						REMARKS
	START	#	SIZE	ORDER	TYPE	ACCESS	
Product Code	1000	1	16-bit	Std	U16	R	Always return 64
Register table version number	1001	1	16-bit	Std	U16	R	Always return 1
Firmware version	1002	1	16-bit	Std	U16	R	Least significant word of version number
Manufacture Date (MMYY)	1003	1	16-bit	Std	U16	R	Highest four digits of serial number converted from YYWW to MMYY
Sales Date (MMYY)	1004	1	16-bit	Std	U16	R	
Serial Number 1	1005	1	16-bit	Std	U16	R	Most significant word serial number
Serial Number 2	1006	1	16-bit	Std	U16	R	Least significant word serial number
Power mode	1007	1	16-bit	Std	U16	R/W	Refer to the table in paragraph 3.2.5.

DESCRIPTION	REGISTER						REMARKS
	START	#	SIZE	ORDER	TYPE	ACCESS	
Internal system sample rate	1008	1	16-bit	Std	U16	R	Always return 3600
Slave address	1009	1	16-bit	Std	U16	R/W	1…251 supported
Baud rate	1010	1	16-bit	Std	U16	R/W	Refer to the table in paragraph 3.2.5.
Bus delay	1011	1	16-bit	Std	U16	R/W	x 10ms (== response delay)
Bus timeout	1012	1	16-bit	Std	U16	R	Always return 5
Contract hour	1013	1	16-bit	Std	U16	R/W	0 – 23 Default = 8 (hr)
Lock code	1014	1	16-bit	Std	U16	R/W	Password F1-Series
Lock code enable	1015	1	16-bit	Std	U16	R	0 = Disabled (password = 0) 1 = Enabled (password <> 0)
LCD contrast	1016	1	16-bit	Std	U16	R	Always return 6

2.4.3 CONTROL REGISTER

DESCRIPTION	REGISTER						REMARKS
	START	#	SIZE	ORDER	TYPE	ACCESS	
Control Register	70	1	16-bit	Std	U16	R/W	Write 30000 to reset Grand Total (Total)

2.4.4 REAL TIME

DESCRIPTION	REGISTER						REMARKS
	START	#	SIZE	ORDER	TYPE	ACCESS	
Year	1200	1	16-bit	Std	U16	R/W	Real year = reg. value + 2000
Month	1201	1	16-bit	Std	U16	R/W	1 – 12
Day	1202	1	16-bit	Std	U16	R/W	1 – 31
Hour	1203	1	16-bit	Std	U16	R/W	0 – 23
Minute	1204	1	16-bit	Std	U16	R/W	0 – 59
Seconds	1205	1	16-bit	Std	U16	R/W	0 – 59

2.4.5 HOLDING REGISTERS

DESCRIPTION	REGISTER						REMARKS
	START	#	SIZE	ORDER	TYPE	ACCESS	
Real date	17007	2	16-bit	Std	FP	R	6 digits: MMDDYY 14 August 2017 = 081417
	8006	2	16-bit	Std	FP	R	
	7003	1	32-bit	Std	FP32	R	
Real time	17009	2	16-bit	Std	FP	R	6 digits: HHMMSS 13:46:55 = 134655
	8008	2	16-bit	Std	FP	R	
	7004	1	32-bit	Std	FP32	R	
Grand Total (Total)	17011	2	16-bit	Std	FP	R	in configured units for Total Returns the value of the clearable total
	8010	2	16-bit	Std	FP	R	
	550	2	16-bit	Rev	FP	R	
	7005	1	32-bit	Std	FP32	R	
Instantaneous flowrate	17013	2	16-bit	Std	FP	R	in configured units for Flowrate
	8012	2	16-bit	Std	FP	R	
	552	2	16-bit	Rev	FP	R	
	7006	1	32-bit	Std	FP32	R	
Daily total	17015	2	16-bit	Std	FP	R	in configured units for Total
	8014	2	16-bit	Std	FP	R	
	554	2	16-bit	Rev	FP	R	
	7007	1	32-bit	Std	FP32	R	
Previous day total	17027	2	16-bit	Std	FP	R	in configured units for Total
	8026	2	16-bit	Std	FP	R	
	556	2	16-bit	Rev	FP	R	
	7013	1	32-bit	Std	FP32	R	
Accumulated Total	17047	2	16-bit	Std	FP	R	in configured units for Total
	8046	2	16-bit	Std	FP	R	
	7023	1	32-bit	Std	FP32	R	
Calculated K-Factor	17081	2	16-bit	Std	FP	R	in configured units for Total
	8080	2	16-bit	Std	FP	R	
	7040	1	32-bit	Std	FP32	R	

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