CALEC® ST III
Standard & Smart

Multi-protocol heating and cooling energy calculator

Protocol description Wireless M-Bus (wM-Bus)

Contents

Legal notice

Document release index

Version	Date	Modifications(s)
01	22.09.2021	First release

Original instructions

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The figures and information in these instructions are subject to technical changes that become necessary to improve the product.

1. General Information

This manual contains only specific information about the CALEC® ST III with Wireless M-Bus (wM-Bus) radio Interface. Further information can be found in the CALEC® ST III technical documentation (Installation guide, User manual or Technical datasheet).

REFERENCE	
📖ⓘ	Additional documents can be found on the following website: [CALEC® ST III Standard & Smart INTEGRA Metering (integra-metering.com)](#)

2. CALEC® ST III Wireless M-Bus Information

The below part manage the radio frame without AES encryption and without Check-Sum.

All data records are explain, but the real frame content depend on the CALEC ST III Configuration (see Chapter 3).

Field Name	Content	Bytes [hex]	Bytes [hex] plain
Message header	L Field	Length of data (XX bytes)	LEN
	C Field	Send - No Reply	44h
	M Field	Manufacturer code (IMT)	B4h
	M Field	Manufacturer code (IMT)	25h
	A Field	Ident No. LSB (BCD)	IDENT
	A Field	Ident No. (BCD)	IDENT
	A Field	Ident No. (BCD)	IDENT
	A Field	Ident No. MSB (BCD)	IDENT
	A Field	Version C0 - CC (see list above)	DEV
	A Field	Device type 0x04 = Return (Warm water) 0x0C = Flow 0x07 = Water	MED
	CI Field	7Ah (short header)	7Ah
	Access No.	Shared Access number of Meter	0-255
	Status	Bit 0-2 = not used Bit 3 = permanent error Bit 4 = temporary error Bit 5-7 = not used (Status according to EN13757)	STATUS
	Config Field	NNNNCCRHb (X encr. blocks)	X0h
	Config Field	BASMMMMMb (unidir., sync., AES)	25h
	AES-Verify	Encryption verification	2Fh

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	AES-Verify	Encryption verification	2Fh
– Main energy counter	DIF		04h
	VIF	Depends on Unit:	
		0.001 kWh (10^0 Wh)	03h
		0.01 kWh (10^1 Wh)	04h
		0.1 kWh (10^2 Wh)	05h
		0.001 MWh / 1 kWh (10^3 Wh)	06h
		0.01 MWh (10^4 Wh)	07h
		0.1 MWh (10^{-1} MWh)	FB00 h
		1 MWh (10^0 MWh)	FB01h
		0.001 MJ (10^3 J)	0Bh
		0.01 MJ (10^4 J)	0Ch
		0.1 MJ (10^5 J)	0Dh
		0.001 GJ / 1 MJ (10^6 J)	0Eh
		0.01 GJ (10^7 J)	0Fh
		0.1 GJ (10^{-1} GJ)	FB08h
		1 GJ (10^0 GJ)	FB09h
		0.001 kBTU (10^{-3} kBTU)	803Dh
		0.01 kBTU(10^{-2} kBTU)	813Dh
		0.1 kBTU(10^{-1} kBTU)	823Dh
		0.001 MBTU / 1 kBTU (10^0 kBTU)	833Dh
		0.01 MBTU (10^1 kBTU)	843Dh
		0.1 MBTU (10^5 kBTU)	853Dh
		1 MBTU (10^6 kBTU)	863Dh
	Value		INT4
– Energy reading 2	DIF		84h, 40h
	VIF	Depends on Unit:	
		0.001 kWh (10^0 Wh)	03h
		0.01 kWh (10^1 Wh)	04h
		0.1 kWh (10^2 Wh)	05h
		0.001 MWh / 1 kWh (10^3 Wh)	06h
		0.01 MWh (10^4 Wh)	07h
		0.1 MWh (10^{-1} MWh)	FB00 h
		1 MWh (10^0 MWh)	FB01h
		0.001 MJ (10^3 J)	0Bh
		0.01 MJ (10^4 J)	0Ch
		0.1 MJ (10^5 J)	0Dh
		0.001 GJ / 1 MJ (10^6 J)	0Eh
		0.01 GJ (10^7 J)	0Fh
		0.1 GJ (10^{-1} GJ)	FB08h
		1 GJ (10^0 GJ)	FB09h
		0.001 kBTU (10^{-3} kBTU)	803Dh
		0.01 kBTU(10^{-2} kBTU)	813Dh
		0.1 kBTU(10^{-1} kBTU)	823Dh
		0.001 MBTU / 1 kBTU (10^0 kBTU)	833Dh
		0.01 MBTU (10^1 kBTU)	843Dh
		0.1 MBTU (10^5 kBTU)	853Dh
		1 MBTU (10^6 kBTU)	863Dh

	Value		INT4
– Energy Tariff 2	DIF		84h, 10h
	VIF	Depends on Unit:	
		0.001 kWh (10^0 Wh)	03h
		0.01 kWh (10^1 Wh)	04h
		0.1 kWh (10^2 Wh)	05h
		0.001 MWh / 1 kWh (10^3 Wh)	06h
		0.01 MWh (10^4 Wh)	07h
		0.1 MWh (10^{-1} MWh)	FB00 h
		1 MWh (10^0 MWh)	FB01h
		0.001 MJ (10^3 J)	0Bh
		0.01 MJ (10^4 J)	0Ch
		0.1 MJ (10^5 J)	0Dh
		0.001 GJ / 1 MJ (10^6 J)	0Eh
		0.01 GJ (10^7 J)	0Fh
		0.1 GJ (10^{-1} GJ)	FB08h
		1 GJ (10^0 GJ)	FB09h
		0.001 kBTU (10^{-3} kBTU)	803Dh
		0.01 kBTU(10^{-2} kBTU)	813Dh
		0.1 kBTU(10^{-1} kBTU)	823Dh
		0.001 MBTU / 1 kBTU (10^0 kBTU)	833Dh
		0.01 MBTU (10^1 kBTU)	843Dh
		0.1 MBTU (10^5 kBTU)	853Dh
		1 MBTU (10^6 kBTU)	863Dh
	Value		INT4
– Energy Tariff 3	DIF		84h, 20h
	VIF	Depends on Unit:	
		0.001 kWh (10^0 Wh)	03h
		0.01 kWh (10^1 Wh)	04h
		0.1 kWh (10^2 Wh)	05h
		0.001 MWh / 1 kWh (10^3 Wh)	06h
		0.01 MWh (10^4 Wh)	07h
		0.1 MWh (10^{-1} MWh)	FB00 h
		1 MWh (10^0 MWh)	FB01h
		0.001 MJ (10^3 J)	0Bh
		0.01 MJ (10^4 J)	0Ch
		0.1 MJ (10^5 J)	0Dh
		0.001 GJ / 1 MJ (10^6 J)	0Eh
		0.01 GJ (10^7 J)	0Fh
		0.1 GJ (10^{-1} GJ)	FB08h
		1 GJ (10^0 GJ)	FB09h
		0.001 kBTU (10^{-3} kBTU)	803Dh
		0.01 kBTU(10^{-2} kBTU)	813Dh
		0.1 kBTU(10^{-1} kBTU)	823Dh
		0.001 MBTU / 1 kBTU (10^0 kBTU)	833Dh
		0.01 MBTU (10^1 kBTU)	843Dh
		0.1 MBTU (10^5 kBTU)	853Dh
		1 MBTU (10^6 kBTU)	863Dh
	Value		INT4

– Main volume counter	DIF		04h
	VIF	Depends on Unit:	
		0.001 m3 (10^{-3} m^3)	13h
		0.01 m3 (10^{-2} m^3)	14h
		0.1 m3 (10^{-1} m^3)	15h
		1 m3 (10^0 m^3)	16h
		0.001 USGAL (10^{-3} USGAL)	903Dh
		0.01 USGAL (10^{-2} USGAL)	913Dh
		0.1 USGAL (10^{-1} USGAL)	923Dh
		1 USGAL (10^0 USGAL)	933Dh
	Value		INT4
– volume counter 2	DIF		84h, 40h
	VIF	Depends on Unit:	
		0.001 m3 (10^{-3} m^3)	13h
		0.01 m3 (10^{-2} m^3)	14h
		0.1 m3 (10^{-1} m^3)	15h
		1 m3 (10^0 m^3)	16h
		0.001 USGAL (10^{-3} USGAL)	903Dh
		0.01 USGAL (10^{-2} USGAL)	913Dh
		0.1 USGAL (10^{-1} USGAL)	923Dh
		1 USGAL (10^0 USGAL)	933Dh
	Value		INT4
– volume counter tariff 2	DIF		84h, 10h
	VIF	Depends on Unit:	
		0.001 m3 (10^{-3} m^3)	13h
		0.01 m3 (10^{-2} m^3)	14h
		0.1 m3 (10^{-1} m^3)	15h
		1 m3 (10^0 m^3)	16h
		0.001 USGAL (10^{-3} USGAL)	903Dh
		0.01 USGAL (10^{-2} USGAL)	913Dh
		0.1 USGAL (10^{-1} USGAL)	923Dh
		1 USGAL (10^0 USGAL)	933Dh
	Value		INT4
– Main Masse counter	DIF		04h
	VIF	Depends on Unit:	
		0.001 t (10^{-3} t)	1Bh
		0.01 t (10^{-2} t)	1Ch
		0.1 t (10^{-1} t)	1Dh
		1 t (10^0 t)	1Eh
	Value		INT4
– Masse counter 2	DIF		84h, 40h
	VIF	Depends on Unit:	
		0.001 t (10^{-3} t)	1Bh
		0.01 t (10^{-2} t)	1Ch
		0.1 t (10^{-1} t)	1Dh
		1 t (10^0 t)	1Eh
	Value		INT4
	DIF		04h

– Auxiliary counter 1	VIF	Unit: HCA	6Eh
	Value		INT4
– Auxiliary counter 2	DIF		84h, 40h
	VIF	Unit: HCA	6Eh
	Value		INT4
– Power [W]	DIF		05h
	VIF	Unit: W	2Bh
	Value		Float
– Power 2 [W]	DIF		85h, 40h
	VIF	Unit: W	2Bh
	Value		Float
– Flow [l/h]	DIF		05h
	VIF	Unit: l/h	3Bh
	Value		Float
– Flow 2 [l/h]	DIF		85h, 40h
	VIF	Unit: l/h	3Bh
	Value		Float
– Mass Flow [kg/h]	DIF		05h
	VIF	Unit: kg/h	53h
	Value		Float
– Mass Flow 2 [kg/h]	DIF		85h, 40h
	VIF	Unit: kg/h	53h
	Value		Float
– Flow temperature [°C]	DIF		05h
	VIF	Unit: °C	5Bh
	Value		Float
– Return temperature [°C]	DIF		05h
	VIF	Unit: °C	5Fh
	Value		Float
– Current Date and Time	DIF		04h
	VIF		6Dh
	Value	MBus typ F format	INT4

3. Wireless M-Bus Frame Structure

Based on the CALEC ST III Configuration, the frame content different type of information.

The table below explain all possibilities.

Type	Code
Standard	0xC0
Mass	0xC1
Flow	0xC2
Adder	0xC3
BDE	0xC4
TGR	0xC7

BDV	0xC8
DTF	0xC9
Twin-V	0xCA
Twin-E	0xCB
Tarif 8	0xCC

Device	Input 1	Input 2	energy	energy 2	energy 2t	energy 3t	volume	volume 2	volume 2t	mass	mass 2	auxillary 1	auxillary 2	power	power 2	flow	flow 2	mass flow	mass flow 2	Th	Tc	time and date
C0/C5	Volume	Volume	x				x	x						x		x	x			x	x	x
C0/C5	Volume	Mass	x				x				x			x		x			x	x	x	x
C0/C5	Volume	Energy	x	x			x							x	x	x				x	x	x
C0/C5	Volume	Alarm	x				x							x		x				x	x	x
C0/C5	Volume	HCA	x				x						x	x		x				x	x	x
C1	Volume	Volume	x					x		x				x			x	x		x	x	x
C1	Volume	Mass	x							x	x			x				x	x	x	x	x
C1	Volume	Energy	x	x						x				x	x			x		x	x	x
C1	Volume	Alarm	x							x				x				x		x	x	x
C1	Volume	HCA	x							x			x	x				x		x	x	x
C2/C6	HCA	HCA										x	x										x
C2/C6	HCA	Volume						x				x							x				x
C2/C6	HCA	Mass								x	x									x			x
C2/C6	HCA	Energy		x								x			x								x
C2/C6	HCA	Status										x											x
C2/C6	Volume	HCA					x						x			x							x
C2/C6	Volume	Volume					x	x								x	x						x
C2/C6	Volume	Mass					x				x					x				x			x
C2/C6	Volume	Energy		x			x								x	x							x
C2/C6	Volume	Status					x									x							x
C2/C6	Mass	HCA								x			x						x				x

Code			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
C2/C6	Mass	Volume						x		x										x	x	x
C2/C6	Mass	Mass								x	x									x	x	x
C2/C6	Mass	Energy		x						x					x					x		x
C2/C6	Mass	Status								x										x		x
C2/C6	Energy	HCA	x										x	x								x
C2/C6	Energy	Volume	x					x						x				x				x
C2/C6	Energy	Mass	x								x			x						x		x
C2/C6	Energy	Energy	x	x										x	x							x
C2/C6	Energy	Status	x											x								x
C2/C6	Alarm	HCA											x									x
C2/C6	Alarm	Volume						x										x				x
C2/C6	Alarm	Mass									x									x		x
C2/C6	Alarm	Energy		x											x							x
C2/C6	Alarm	Status																				x
C2/C6	Alarm	Alarm																				x
C3	Volume	Volume					x									x	x					x
C3	HCA	HCA										x										x
C3	Energy	Energy	x											x	x							x
C3	Mass	Mass								x								x	x			x
C4	Volume	HCA	x		x		x		x				x	x		x				x	x	x
C4	Volume	Alarm	x		x		x		x					x		x				x	x	x
C7	Volume	HCA	x		x	x	x						x	x		x				x	x	x
C7	Volume	Alarm	x		x	x	x							x		x				x	x	x
C8	Volume	Volume	x	x			x	x						x		x				x	x	x
C8	Volume	Status	x	x			x	x						x		x				x	x	x
C9	Volume	Status	x		x		x		x					x		x				x	x	x
CA	Volume	Volume	x				x							x		x	x			x	x	x
CB	Volume	Volume	x	x			x	x						x	x	x	x			x	x	x
CC	Volume	HCA	x				x						x	x		x				x	x	x

| CC | Volume | Alarm | x | | | | x | | | | | | x | | x | | | | x | x | x |