



Elster GmbH
Steinern Straße 19-21
55252 Mz.-Kastel
Germany

T +49 (0)6134 6050
www.elster.com

DOCUMENT TITLE
NAMUR INTERFACE SPECIFICATION

DOCUMENT NUMBER
NAMUR INTERFACE SPECIFICATION

PROJECT
ENCODER

REVISION DATE
2012-10-10

Namur Interface Specification

001	2012-10-10	Initial version	M.BADURA	G.PFISTER	M.FRANZ
Revision	Date	Description	Author	Checked	Approved

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 1 OF 7
This reproduction is sole property of Elster NV/SA,Essen, Belgium and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand.								



	Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany T +49 (0)6134 6050 www.elster.com	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
		DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
		PROJECT ENCODER	PROJECT ENCODER

Table of contents

1	Introduction	3
1.1	Document purpose	3
1.2	Abbreviations	4
1.3	Open Items	4
2	Description of the interface/protocol.....	5
2.1	Serial interface	5
2.1.1	Signal level	5
2.1.2	Transmission rate	5
2.2	Description of the protocol	5
2.2.1	Data elements.....	5
2.2.2	Timing	6
2.3	Transmission security.....	6
3	Reference	7

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 2 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								

	<p>Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany</p> <p>T +49 (0)6134 6050 www.elster.com</p>	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
		DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
		PROJECT ENCODER	PROJECT ENCODER


1 Introduction

This document reflects the specification of the NAMUR Interface for Elster-Encoder products.

1.1 Document purpose

The purpose of this document is to specify the interface and communication protocol of the Encoder-Products

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 3 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								

	<p>Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany</p> <p>T +49 (0)6134 6050 www.elster.com</p>	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
		DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
		PROJECT ENCODER	PROJECT ENCODER


1.2 Abbreviations

BCC	Block Check Character
CR	Carriage Return
LF	Line Feed
US	Space

1.3 Open Items

Oltem 1: -

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 4 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								

	Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany T +49 (0)6134 6050 www.elster.com	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
		DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
		PROJECT ENCODER	PROJECT ENCODER

2 Description of the interface/protocol

2.1 Serial interface

2.1.1 Signal level

The levels of the signal must be conform to the EN 60947-5-6

I Mark	> 2,1 mA	(<3,9 mA)
I Space	< 1,2 mA	
Power supply:	8,2 V	incl. internal resistance: 1 kΩ

2.1.2 Transmission rate

Transmission rate:	2400 Baud
Data format:	7E1

2.2 Description of the protocol

The first character in the data string describes the following data element. Allowed character are "a" to "z". Currently are only "a" and "b" clearly defined.

2.2.1 Data elements


a <US>	Data element name: "Totalizer reading" (Zählwerkstand)
zzzzzzzz <US>	Totalizer reading, max 8 digits
ww <US>	Value of totalizer reading with power of ten incl. algebraic sign
eee <US>	Unit of the totalizer reading
s <US>	Status; one byte ASCII 30 to 3F 30 → no error 31 → LED defect 32 → Register read out error 34 → counter wheel error or combination of these status messages
<BCC>	Block check character, longitudinal parity over all characters, Start value: 0x7F
<CR><LF>	End

Table 1 – Data element "a"

b <US>	Data element name: "Nameplate" (Typenschild)
HHH <US>	Manufacture code
TTTT <US>	Device type or meter size
SSSSSSS <US>	Serial number
JJ <US>	Manufacturing year
VVVV <FS>	Software version
<BCC>	Block check character, longitudinal parity over all characters, Start value: 0x7F
<CR><LF>	End

Table 2 – Data element "b"

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 5 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								

 Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany T +49 (0)6134 6050 www.elster.com	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
	DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
	PROJECT ENCODER	PROJECT ENCODER

2.2.2 Timing

The original absolute encoder needs time for the read out of the counter wheels and to handle the data. The timing depends on the device. The following values are some values from the Elster ENCODER S1 for orientation.

Action:	Time [ms]	Description
Initialization	60	Prepare the measurement
Read out the counter wheels	380	(9 x 24ms LL + 9 x 18ms Cal)
Measure LED currents	50	(40 x 1ms)
Prepare protocol	80	Read EPROM, configure protocol
Send protocol	270	Only protocol "a" (2400 Baud)

Table 3 – Data transfer timing

The timing starts direct after the power supply enables the ENCODER and repeat continually in a fixed period time the data transfer until the power supply will disable. The repeat frequency of the data transfer will be configured in service mode, is stored in the EPROM and can't change in the operating state.

The repeat frequency can also be lower, when the power supply unit disables the power for the ENCODER after the first reading sequence.

The maximum repeat frequency depends on the total timing of the ENCODER. In case of table 3 is the total timing 840 ms and the frequency 1,19 Hz

2.3 Transmission security


1. The index head/ENCODER works only in push mode, that means that the ENCODER is not able to receive data.
2. The configuration of the ENCODER can't be changed if it is in operation. Changes on the configuration only possible in the "service mode", which is locked about software and hardware. The hardware lock can only be disabled if the index head is open. The index head is sealed.
3. The electronic of the index head/ENCODER monitor functions and send the error information with the status byte to the reading device. Following errors are possible to detect:
 - Break or short-circuit of the LED and photo transistor
 - Communication error with the EPROM
 - Error of the read-out (e.g. counter wheels rotate too fast)
4. Data monitoring with block check character, longitudinal parity over all characters
5. Unit-separator prevents a misinterpretation of the data

The reading device has the possibility to make a plausibility check of the received data from the periodic sending (min. every 20 s) index head/ENCODER.

The connection cable from the index head/ENCODER to the reading device must be sealed.

It is every time possible to check the meter reading in the reading device with the mechanical index.

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 6 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								

	<p>Elster GmbH Steinern Straße 19-21 55252 Mz.-Kastel Germany</p> <p>T +49 (0)6134 6050 www.elster.com</p>	DOCUMENT TITLE NAMUR INTERFACE SPECIFICATION	
		DOCUMENT NUMBER NAMUR INTERFACE SPECIFICATION	
		PROJECT ENCODER	PROJECT ENCODER

3 Reference

- [1] **DIN EN 60947-5-6: Low-voltage switchgear and control gear**
Part 5-6: Control circuit devices and switching elements – DC interface proximity sensors and switching amplifiers (NAMUR)
- [2] **DIN EN 60079-11: Explosive atmospheres**
Part 11: Equipment protection by intrinsic safety „i“

DOCUMENT NAMUR INTERFACE SPECIFICATION								
PROJECT nr. ENCODER	PROJ. CODE -	DOC.TYPE -	DOC. REV. 1	DISC. -	LOC.	FILE TYPE DOC	CLASSIFICATION PUBLIC	PAGE 7 OF 7
This reproduction is sole property of Elster GmbH and is subject to the conditions that it or any information contained therein will not be used in any way detrimental to our interests and that all copies will be returned immediately on demand								