

Energy Analyzer: QA/S 1.16.1 Commissioning an Energy Actuator

GPG BUILD	SPG BUILDING AUTOMATION							
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Department: BA Engineering		Author:	Engineering Team BA/DESTO					
System:	i-bus® KNX	Product:	Product: QA/S 1.16.1, SE/S 3.16.1					
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Introduction

Measured values from the KNX bus can now be processed with the new device variant of the Energy Analyzer, the QA/S 1.16.1. This allows the Energy Actuator SE/S 3.16.1 to be conveniently integrated into this web-based system. This means that you can not only collect and save but also analyze and display the Energy Actuator's consumption and instantaneous values.

The SE/S is available for the Energy Analyzer exclusively as an overall metering point for the detailed recording of all consumption figures (**Analytics -> Historical Data**). That means that it is not possible to distinguish between Channels A, B and C for this type of evaluation.

However, the instantaneous values (e.g., current, voltage) from the individual channels can be visualized using the widget function in the dashboard. The Energy Actuator's Channel A is used in this document as an example of this.



Fig. 1 Energy Analyzer QA/S 1.16.1



Fig. 2 Energy Actuator SE/S 3.16.1

Objectives of the document

This document is designed to help you correctly commission an Energy Actuator (SE/S 3.16.1) and the Energy Analyzer (QA/S 1.16.1). We explain the necessary parameterization for the two devices step by step.

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Content

Before the Energy Analyzer QA/S can be prepared or parametrized to display the desired ABB meter (here: SE/S), the settings must first be made in the Energy Actuator SE/S itself. It is essential that these settings are made, as otherwise it is <u>not</u> possible to ensure that the measured values can be recorded and displayed in the QA/S.

Note:

The parameter settings displayed below are intended only as an example. They enable smooth communication between the SE/S and QA/S.

SE/S parameters

5.5.100 SE/S3.16.1 Energy Actuato	or,3-fold,16/20A,MDRC > General	
General	Sending delay after bus voltage recovery in s [2255]	2
Metering (Wh)	Send communication object "In operation"	send value 1 cyclically
Function	Sending cycle time in s [165,535]	60 🗘
Meter reading total (Wh)	Limit number of telegrams	◎ no
Active power total	Enable communication object "Request status values" 1 bit	🔵 no 🔘 yes 🛛 2
Frequency	Request with object value	0 or 1 👻
A: General	Enable communication object "Request instrument values" 1 bit	o no yes
A: Function	Enable communication object "Request power values" 1 bit	◎ no) yes
A: Metering (Wh)	Cycle time for instrument values in s [065,535, 0 = do not send cycl.]	300
A: Instrument and power values	Cycle time for power values in s [065.535, 0 = do not send cycl.]	300

Fig. 3 SE/S ETS parameters

1: Recommendation (optional): Enabling the "In operation" object. This group object is used to monitor the presence of the Energy Actuator on the KNX bus. Cyclical monitoring ensures that the SE/S regularly sends the recorded meter data to the Energy Analyzer. We also recommend that you adjust this cycle time to the sending cycle time of the object of the same name in the QA/S (Fig. 9).

2: Recommendation (optional): The object "Request status values" provides valuable information, such as measurement circuit active.

3: Adjust the sending cycle time to the data capture of the QA/S (every 5 minutes).

SE/S parameters

5.5.100 SE/S3.16.1 Energy Actuator,3-fold,16/20A,MDRC > Metering (Wh)								
General	Enable communication object "Request meter readings" 1 bit	no yes						
Metering (Wh)	Transmission delay meter readings in s [065,535]							
Function	Cycle time for meter readings in s [0172,800, 0 = do not send cycl.]	300 4	▲ ▼					
Meter reading total (Wh)	All meters resettable via object	🔘 no 🔵 yes						
Active power total	Enable "Meter reading total"	🔵 no 🔘 yes 🛛 5						

Fig. 4 SE/S ETS parameters

4+5: The historical data in the QA/S is calculated and recorded on the basis of the object "Meter reading total". For that reason, the sending cycle time <u>must</u> also be adjusted to the data capture in the QA/S (every 5 minutes) in addition to enabling the object.

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SE/S parameters

5.5.100 SE/S3.16.1 Energy Actuator,3-fold,16/20A,MDRC > Meter reading total (Wh)							
General	Send "Meter reading total"	cyclically 6	•				
Metering (Wh)	Cycle time and request objects are set on "Metering (Wh)"	< NOTE					
Function	Send "Intermediate meter reading total"	no, update only	•				
Meter reading total (Wh)	Trigger 1 (Start) is activated by	I bit object Time					

Fig. 5 SE/S ETS parameters

6: For the sake of simplicity, the total meter should send its values cyclically so that the QA/S can always record and calculate up-to-date data.

As previously mentioned, we also want to display individual values from Channel A on the dashboard. To do so, the desired instrument and power values in the application of the SE/S must be enabled accordingly.

Tip: It is wise to send the values cyclically here, too.

Now let's take a look at the SE/S group objects.

The necessary objects for smooth operation with the QA/S and to ensure the data logging in **Analytics -> Historical Data** are marked in <mark>yellow</mark>.

Note: As soon as nominal voltage is applied to at least one SE/S output, the measurement circuit will be active.

The optional instrument and power values to later be displayed on the **dashboard** are marked in green.

₽2 0	System	In operation	SE/S in operation	8/3/0	1 bit	К	-	-	Ü	-
∎≹ 4	General	Request status values	Request status	8/3/1	1 bit	Κ	-	S	-	-
■2 8	General	Receive time			3 bytes	Κ	-	S	-	-
₽ ₽	Diagnose	Measurement circuit active	Measurement circuit active	8/3/2	1 bit	Κ	L	-	Ü	-
₽ 2 31	Meter total	Meter reading	Meter total	8/3/3	4 bytes	Κ	L	-	Ü	-
32	Intermediate meter total	Meter reading			4 bytes	Κ	L	-	Ü	-
2 33	Intermediate meter total	Status			1 byte	Κ	L	-	Ü	-
2 34	Intermediate meter total	Receive trigger 1			1 bit	Κ	-	S	-	-
■≵ 35	Intermediate meter total	Receive trigger 2			1 bit	Κ	-	S	-	-
■2 37	Active power total	Active power	Active power total	8/3/4	4 bytes	Κ	L	-	Ü	-
∎≹ 44	Frequenz	Frequency	Frequency	8/3/5	4 bytes	К	L	-	Ü	-
■‡ 51	Diagnostics	Frequency error			1 bit	Κ	L	-	Ü	-
■컱 60	A: Schalten	Switch	Channel A: Switch	8/3/6	1 bit	Κ	-	S	-	-
■‡ 62	A: Diagnostics	Status byte			1 byte	Κ	L	-	Ü	-
■2 71	A: Contact	Contact monitoring			1 bit	К	L	-	Ü	-
■# 74	A: Meter	Meter reading	Channel A: Meter reading	8/3/7	4 bytes	Κ	L	-	Ü	-
₹75	A: Intermediate meter	Meter reading			4 bytes	Κ	L	-	Ü	-
■2 76	A: Intermediate meter	Status			1 byte	Κ	L	-	Ü	-
■2 77	A: Intermediate meter	Receive trigger 1			1 bit	Κ	-	S	-	-
■≵ 78	A: Intermediate meter	Receive trigger 2			1 bit	Κ	-	S	-	-
■2 82	A: Active power	Active power	Channel A: Active Power	8/3/8	4 bytes	Κ	L	-	Ü	-
■≵ 89	A: Current	Current value	Channel A: Current	8/3/9	4 bytes	Κ	L	-	Ü	-
■≵ 96	A: Voltage	Voltage	Channel A: Voltage	8/3/10	4 bytes	К	L	-	Ü	-

Fig. 6 SE/S group objects view

After successful commissioning of the SE/S, the QA/S 1.16.1 now needs to be adjusted.

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QA/S parameters

5.0	5.0.9 QA/S1.16.1 Energy Analyzer, 16-fold, MDRC > Meter 2 > SE/S								
	General	Device selection	ABB: SE/S Energy	Actuator	• 1				
	Load Control	Name	Meter 2 - SE/S	2					
+	Meter 1	Location	Unit A	3					
		Serial number	012345	4					
-	Meter 2	Enable Group object "Request meter/sensor reading"	🔘 No 🔵 Yes						
	SE/S	Monitor "In Operation" Group object	Yes, both values		▼ 5				
+	Meter 3	Cycle time	60		Å ₩ S				
+	Meter 4	Send power values to load control	No		•				



1: Selecting the desired meter/actuator-> SE/S.

2 - 4: In order to clearly identify the meter, we recommend that you directly enter the meter name, place of installation and the serial number or meter number in these fields. This information will then appear in the WebUI, which will simplify the subsequent commissioning and the evaluation of the recorded meter data.

5: If you decide on cyclical monitoring (Fig. 3), the "In operation" group object must be enabled in the QA/S as well as in the SE/S. We also recommend that you adjust this cycle time to the sending cycle time of the object of the same name in the SE/S.

7	0	System	In operation	SE/S in operation	8/3/0	1 bit	Κ -	-	Ü-	
---	---	--------	--------------	-------------------	-------	-------	-----	---	----	--

Fig. 8 SE/S group object "In operation"

Note: As the QA/S calculates and records data every 5 minutes, a shorter cycle time should be selected for the "In operation" object so that the data recorded are also always up to date.

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	131	Meter 2: SE/S	In operation	SE/S in operation	8/3/0	1 bit	Κ	L	S	Ü	А
l	135	Zähler 2: SE/S	Request status values	Request status	8/3/1	1 bit	Κ	L	-	Ü	-
	136	Zähler 2: SE/S	Measurement circuit active	Measurement circuit active	8/3/2	1 bit	Κ	-	S	Ü	А
	141	Zähler 2: SE/S	Meter reading	Meter total	8/3/3	4 bytes	К	-	S	Ü	А
	142	Zähler 2: SE/S	Active power	Active power total	8/3/4	4 bytes	Κ	-	S	Ü	Α
	143	Zähler 2: SE/S	Frequency	Frequency	8/3/5	4 bytes	Κ	-	S	Ü	А
	151	Zähler 2: SE/S	A: Meter reading	Channel A: Meter reading	8/3/7	4 bytes	Κ	-	S	Ü	А
	152	Zähler 2: SE/S	A: Active power	Channel A: Active Power	8/3/8	4 bytes	Κ	-	S	Ü	А
	153	Zähler 2: SE/S	A: Current	Channel A: Current	8/3/9	4 bytes	Κ	-	S	Ü	А
	154	Zähler 2: SE/S	A: Voltage	Channel A: Voltage	8/3/10	4 bytes	Κ	-	S	Ü	Α
	155	Zähler 2: SE/S	A: Apparent power	Kanal A: Scheinleistung	8/3/11	4 bytes	Κ	-	S	Ü	А
	156	Zähler 2: SE/S	A: Power factor	Kanal A: Leistungsfaktor	8/3/12	4 bytes	Κ	-	S	Ü	А

Let's take a look at the compatible group objects of the QA/S that are now activated.

Fig. 9 QA/S group objects view

In addition to the aforementioned object "In operation", two other objects also play an important role.

1. "*Measurement circuit active*": Must be connected to the SE/S object "Measurement circuit active"; it is **imperative** that it is <u>active</u>.

■⊉ 9	Diagnose	Measurement circuit active	Measurement circuit active	8/3/2	1 bit	K L		Ü	-
------	----------	----------------------------	----------------------------	-------	-------	-----	--	---	---

Fig. 10 SE/S group object "Measurement circuit active"

- → The object "Request status values" mentioned in Fig. 1 can be used to manually request the status of the SE/S measurement circuit.
- 2. "*Meter reading*": In order to record the historical data, it is essential that this object is also linked to the SE/S remote terminal.

All other objects are optional. Values such as current, voltage and frequency are examples of what are known as instantaneous values and are displayed by the widgets on the dashboard (taken from Channel A in this example).

Once the application has been successfully downloaded, this configured meter can then be set up in the metering structure.

To do so, you must be logged in as an admin.

Title 9AKK107991A4995 A 6/11 When you are logged into the WebUI of the Energy Analyzer, we recommend that you carry out the metering structure manually. This will allow you to individually arrange buildings and stories, etc. We recommend that you adjust the meters' place of installation to this structure.

A node (virtual meter) must then be set up; in this example it is My Building.

Once this step is complete, up to 16 meters (metering points) can belong to the node.

1. Creating a metering point

	atic 🖾 Dashboard	Manalytics	면 Load control	Management	fåf System		12/11/2020 09:40	٠
Meter Management	Metering Structure	User Management	Tariffs and units	Consumer Group	s Data sharing			
	Metering struc	ture configuratio	on					0
	Search		٩			Legend		
	III My Building			Create sub n	ode b	I Virtual meter		0
				Remove node		∽ Metering point		0
						≠ 6 A III & Medium		0
						E Difference		0

Fig. 11 WebUI: Setting up metering structure

2. Assigning desired meters from the device list

7 Load	(control 📾 Management 10) System		
Taritt	Create node		l
	• Node type		
	Metering point	•	1746
a	• Node name		
	Meter 2 - SE/S		23
	• Medium		i.
	Electricity	× -	
	Meter		93
	Select		
	ELECTRICITY		1
	Meter 2 - SE/S Manufacturer: ABB, Place of installation: Unit A, Serial number: #012345	<u>h</u>	
1			I
1			I
		Cancel Save	

Fig. 12 WebUI: Setting up metering point

Note: The selection of the meters from the device list is dependent on the relevant medium. In this example (where electricity has been selected), it is the previously configured meter (SE/S) with all the information that was pre-stored in the ETS.

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Caution:

Only when communication is present between the QA/S and SE/S (Status = Normal) can the meter be selected from the device list.

ABB	EQma	tic	逦 Dashboard		Analytics	ල් Loa	ad control	f	Manageme	nt	해 System	
Meter Manager	ment	Mete	ring Structure	User Ma	anagement	Tari	ffs and uni	ts	Consumer G	iroups	5 Data sh	naring
		Ove	rview									
		м	ETER NUMBER	*	STATUS		🛛 🗧 PRO	DUCT	ТҮРЕ	*	MEDIUM	×
		2			ОК		SE/S	s			Electricity	

Fig. 13 Device overview / status

If this is not the case, please check the previous steps once again. Depending on the source of the error, the status will then be displayed as follows:

- NOT CONFIGURED
- ERROR
- DISCONNECTED

Assistance in fixing the cause of the fault will be supplied directly in the WebUI. To view it, move the pointer over the ⁹ button.

3. Selecting the consumer group and tariff

If the user has already set up their own consumer groups or tariffs in advance, these can also be selected here straight from the relevant drop-down menu.

Creat	e node		
*Node typ	De		
Meterin	ig point		•
*Node na	me		
Meter 2	- SE/S		
*Medium			
Electric	ity		Ŧ
Meter			
∮ Elect	ricity, ABB, Meter 2 - SE/S, Unit A, #012345		X .
Consume	group		
Select			•
Meter dat	a points		
TARIFF	METER TARIFF DATA POINT	ASSIGNED TARIFF	
0	Active Imported Energy Total	default tariff	•
			Cancel Save

Fig. 14 WebUI: Selecting the consumer group and tariff

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4. Metering structure view

ABB	EQma	atic 📧 Dashboar	d 🛄 Analytics	🕒 Load control	🛱 Management	🚧 System
Meter Manage	ement	Metering Structure	User Management	Tariffs and units	Consumer Groups	Data sharing
		Metering stru	cture configuratio	on		
		Search		Q		
		III My Building				^
		7 Meter	2 - SE/S 🧚			

Fig. 15 WebUI: Metering structure view

As soon as the structure has been set up and the meter is correctly stored, the Energy Analyzer collects the desired data, which can be displayed and processed further in the analysis and/or the dashboard.

As previously mentioned in the introduction, the QA/S can display only the combined SE/S metered values. The instantaneous values such as voltage, current, etc. from the various channels can be displayed by the widgets on the dashboard.

How to set up widgets on the dashboard

1. Activate "Edit" mode in the top right of the "Dashboard" page in the WebUI.

A	BB	EQmatic	Dashboard	L Analytics	ප Load control	🖬 Management	ពំរំ† System	12/11/2020 09:49	٠	*	÷	0	G
	Today	Last 7 days	Last month La	ast quarter Las	t half of year All						Ec	lit mode	5
Fi	g. 16	QA/S D	ashboard										

2. Click on "Add widget".

AB	EQmati	: 🖾 Dashboa	rd 🖿 Analy	tics 🖁 Load co	ntrol 🕯	🖬 Management	Å∮ System	12/11/2020 0 9 :50	٠	*	÷	0	G
То	ay Last 7 day	East month	Last quarter	Last half of year	All					Done	Add v	vidget	ļ

Fig. 17 QA/S Dashboard

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3. Select desired widget.

Add new widget

Instantaneous values	Category 5: 33.33% category 5: 33.33% category 5: 33.33%
Histor	ical Data
Unit [EUR] 25	
20 15 10 Sep 23 Sep 28 Oct 03 Oct 08 Oct 13	Oct 18 Oct 23 Oct 28 Nov 02 Nov 07
20 30 5ep 23 5ep 28 Oct 03 Oct 08 Oct 13 Consumer Ranking	OCT 18 OCT 23 OCT 28 NOV 02 NOV 07 Total values
20 30 5ep 23 5ep 28 Oct 03 Oct 08 Oct 13 Consumer Ranking OWN 50WN 100WN 150Wh	Oct 18 Oct 23 Oct 28 Nev 02 Nev 07 Total values DATA POINT PREVIOUS VALUE CURRENT VALUE CHANGE
20 30 5ep 23 5ep 28 Oct 03 Oct 08 Oct 13 Consumer Ranking OWN 50WN 100WN 130Wh Root node	Oct 18 Oct 23 Oct 28 NOV 02 NOV 07 Total values DATA POINT PREVIOUS VALUE CURRENT VALUE CHANGE F Electricity
Sep 23 Sep 28 Oct 03 Oct 08 Oct 13	Oct 18 Oct 23 Oct 28 Nov 02 Nov 07 Total values Datia PREVIOUS Value CURRENT Value CHANGE Piliting Electricity Cost 55.85 EUR 11.10%
20 30 30 50 50 50 50 50 50 50 50 50 5	Oct JB Oct 23 Oct 28 Nov 02 Nov 07 Total values Total value Felectricity Cost 50.27 EUR 55.85 EUR 11.10% Totals

Fig. 18 QA/S Dashboard

Note: In addition to the mandatory "Instantaneous values" widget, there are another four display options available. However, these relate to the metering point or node, meaning they consider the entire SE/S rather than the individual Channel A that is desired.

4. Configure the "Instantaneous values" widget and then click "Save".

Configure - Instantaneous values



Fig. 19 Configuring the "Instantaneous values" widget

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...after successful configuration of two widgets (here: Active energy and Voltage L1/Channel A).

ł	ABB	EQmatic	📼 Dashboa	rd 🖿 Analy	/tics	ඩ්ප Load co	ontrol	n Management	입다 System
	Today	Last 7 days	Last month	Last quarter	Last	half of year	All		
	👂 SE	/S: Meter ch	nan 🌣	۶ SE/	S: Volt	tage L1	۰		
		1500 Wh) 6,000Wh	ov	230) 920V			

Fig. 20 Dashboard view

With these step-by-step instructions, smooth operation between QA/S and SE/S can be established. You can find more valuable tips & tricks about the energy analyzer but also about other ABB KNX products at ...

References to other documents

- FAQ Home and Building Automation _
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