2.2.1 Start Menu

LIVE DISPLAY:
Shows the live display.

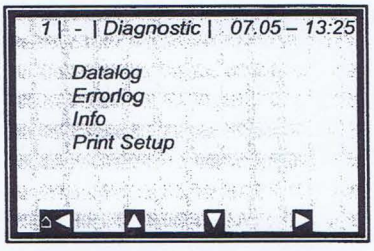
DIAGNOSTIC:
This menu item contains the submenu items data logger, error log and further instrument information.

SETUP:
All necessary inputs for operation of the measuring system can be entered here.

ACCESS LEVEL:
Areas protected by passwords can be enabled.

LANGUAGE:
Select the dialog language.

2.2.2 Diagnostic



Datalog:
The data log records the data corresponding to the content of the serial data output RS 232 and RS 485 (see hardware manual, *chapter 6.4*).

All data per measurement values (sweep) are averaged over the measuring time (see below) and stored. This time interval results from the selected logging period. The content of the log file can be accessed via the Live Display graphically, see chapter 2.3 Trend Display. Output as a text-file is also possible by using RS 232 and RS 485, or the Memory Tool instead (optional accessory).

- Log type — Disable
single
continuous
stop at error
- Log time — logging period
15 minutes to 3 days
- Restart Log — Clears the datalog and starts with the above setting
- Averaging time — Obtained from log time
- Print log — Printout of table, output via RS 232 and RS 485, format see hardware manual, *chapter 6.4*

Change datalog settings:
If you change the logtype from any to „single" the datalog will be cleared and you start again with the current setting.
If you change all other logtypes and log times, the datalog will not be cleared and you continue with the new settings.

Stopped measurement:
If the measurement is stopped for a time during the data log, then the measurement pause is interpreted as log time during the data logging "single". For all other log types, the measuring pause is added to the log time.

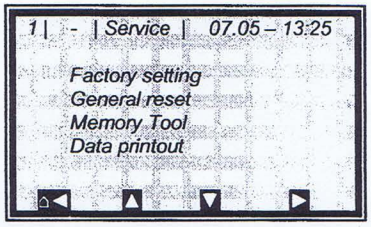
Error log:
- Shows the logged error. The last 20 error messages will be stored with date and time.

Info:
- Tag : ...
- Device type : Control Unit
- Supplier : BMA
- Manufacturer : BMA
- Device no. : ...
- Production no. : ...-...
- Software ver. : V...
- SW release date: ...

Print Setup:
Printout of the start-up protocol via RS 232 and RS 485. Format, content and example see chapter 9.5 Start- up protocol printout.

DI 3 Function:
Assignments for DI 3
- None
- Sample (external control of sampling)
- Product (external product selection)

2.2.29 Service



Factory Settings and general reset:
See table on next page.

Memory Tool:
Communication with the external memory unit (Memory Tool, optional accessory). Data transfer takes place via the 9-pole SubD-connector on the bottom of the instrument.

- Backup settings: all operation parameters for all products are stored in the Memory Tool.
- Upload settings: all operation parameters are loaded into the evaluation unit by the Memory Tool. With that, all parameters are deleted from the evaluation unit.
- Backup data log: the data log is stored on the Memory Tool.
- Backup setup: the start-up protocol is stored on the Memory Tool.

NOTICE

The concentration average value is put on hold during communication with the Memory Tool. With this, the measured value from the current output is also frozen!

Data Printout:
All measurement values for every single measurement (sweep) are sent by the serial interfaces RS 232 and RS 485 (also referred to as raw data).

The output can be adjusted as follows:
- None (disabled)
- Row (data transfer, see Hardware Manual chapter 6.4)
- Table (microwave data for each frequency point)
- Row and table (one data row and one table are output for each sweep)

Default represents "Line".

9.5 Start-up protocol printout

Output is possible by using RS 232 and RS 485. The output is started under menu | DIAGNOSTIC | PRINT SETUP |.

The serial interfaces RS 232 and RS 485 have the following accesses:
Data transfer rate 38400 Bd, 8 data bits, no parity, 1 stop bit.

The protocol will be saved via a terminal program into a TXT-file. To display it e.g. via Excel® the following data format has to be regarded:

Separators: tabulator
Decimal-separator: .
1000-separator: ,

The following **code-list** is for the interpretation of the start-up protocol; see an example of a protocol in chapter 9.5.1.

Parameter	Code-No.	Information
Log type		Log type:
	0	Disabled
	1	Single
	2	Continuous
	3	Stop on error
Log time		Log time:
	0	15 Minutes
	1	1 Hour
	2	4 Hours
	3	8 Hours
	4	1 Day
	5	3 Days
Measuring mode		Meas. mode:
	0	Continuous
	1	Batch
Start mode		Start mode (Start/Stop):
	0	Keypad
	1	Extern
Compensation input		Compensation input:
	0	None
	1	Current In 1
	2	Current In 2
	3	PT100

Parameter	Code-Nr.	Information
Calibration mode		Cal. order:
	0	Lineare regression
	1	Quadratic regression
Calibration variable		Cal. base:
	0	Phase
	1	Attenuation
	2	Both (Phase and Attenuation)
Compensation mode		Compensation mode:
	0	Additive
	1	Multiplicative
Compensation fit		Compensation order:
	0	Lineare regression
	1	Quadratic regression
Measure configuration		Process type:
	0	1 Concentration
	1	2 Concentrationen
	2	Split Concentration
AO Assign Code		Assignment of current output:
	0	None
	1	Concentration
	2	Concentration 2
	3	Current In 1
	4	Current In 2
	5	PT100
AO Alarm select code		Error current for current output:
	0	22 mA
	1	3.5 mA
	2	Hold
	3	Value
Range selection		Current output range:
	0	0 ... 20 mA
	1	4 ... 20 mA
AI Range selection		Current input range:
	0	0 ... 20 mA
	1	4 ... 20 mA
AI Enabled[2]		State current in 2, enabled yes/No
DO Function		Relay function:
	0	None
	1	Error
	2	Hold meas.
	3	No product
	4	Alarm min
	5	Alarm max
DO Assignment		Relay: the min/max alarm is assigned to ...:
	0	Concentration
	1	Concentration 2
	2	Current In 1
	3	Current In 2
	4	PT100

Parameter	Code-Nr.	Information
DI Function selection		Function of digital inputs:
	0	None
	1	Start/Stop
	2	Hold
	3	Sample
	4	Product
Printout mode		Form of data printout:
	0	Disabled
	1	Line
	2	Table
	3	Line + Table
Access level		Access level:
	0	Read only
	1	Basic
	2	Profi
	3	Service
Language		Language:
	0	English
	1	German
	2	French

9.5.1 Examples of a start-up protocol

Menu:	Start of Setup:	Examples of a start-up protocol				Interpretation: (* Only relevant for service)
Product	Entry	Product1	Product2	Prod.3	Prod.4	
Datalog	Log type :	1				See code-list
	Log time :	2				See code-list
	Number of errors :	2				Number of entries into errorlog
	NTC temperature :	45.3 °C				*
	max. NTC temperature :	46.7 °C				*
	9V power supply :	8.94 V				*
Info	Tag :	-				
	Device Type :	Control Unit				
	Unique device ID number :	8005				
	Serial number :	1005				
	Final assembly number :	000-000				
	Software version :	1.00				
	Software release date :	02.06.2009				
	Actual date :	21.07.2009				Record date
	Actual time :	12:18				Record time
Measurement	Measuring mode :	0				See code-list
	Start mode :	0				See code-list
	Filter damping value :	20				Number of average values
	Filter damping value[2] :	20				*
	Filter damping value[3] :	20				*
	Reset average :	FALSE				
Plausibility	Lower limit :	0				Min. Concentration
	Upper limit :	100				Max. Concentration
	Max. phase sigma :	100				Sigma max.
	Correlation Phi/Att :	6				Phi/Att ratio
	Auto-set mode :	FALSE				Auto set: ON/OFF
	Pause detection :	FALSE				
	Minimum attenuation :	-15.0 dB				
Microwave	Ref. cable length :	4.00 m				
	Meas. cable length :	4.00 m				
	Wave band selection :	1				*
	Start frequency :	2				*
	Internal Attenuation :	0				*
Marker	Marker name :	Mark1				For Concentration
	Marker value :	50				For Concentration
	Marker name[2] :	Mark2				For Concentration 2
	Marker value[2] :	50				For Concentration 2
System adjust	Nbr of sweeps for reference:	10				

Calibrate concentration	Compensation input :	0	See code-list
	Compensation reference :	0	
	Calibration mode :	0	See code-list
	Calibration variable :	0	See code-list
	Phase coefficients :	-0.19	A1
	Phase coefficients[2] :	0	A2
	Attenuation coefficients :	0	B1
	Attenuation coefficients[2] :	0	B2
	Constant coefficient :	50	C
	Compensation mode :	0	See code-list
	Compensation fit :	0	See code-list
	Compensation reference :	0	
	Phase coeff. for comp. :	0	C_Ph1
	Phase coeff. for comp.[2] :	0	C_Ph2
	Attenuation coeff. for comp :	0	C_dB1
	Attenuation coeff. for comp[2]	0	C_dB2
	Adjust factor :	1	
	Adjust offset :	0	
Calibrate concentration 2	Compensation input :	0	See code-list
	Compensation reference :	0	
	Calibration mode :	0	See code-list
	Calibration variable :	0	See code-list
	Phase coefficients :	-0.19	A1
	Phase coefficients[2] :	0	A2
	Attenuation coefficients :	0	B1
	Attenuation coefficients[2] :	0	B2
	Constant coefficient :	50	C
	Compensation mode :	0	See code-list
	Compensation fit :	0	See code-list
	Compensation reference :	0	
	Phase coeff. for comp. :	0	C_Ph1
	Phase coeff. for comp.[2] :	0	C_Ph2
	Attenuation coeff. for comp :	0	C_dB1
	Attenuation coeff. for comp[2]	0	C_dB2
	Adjust factor :	1	
	Adjust offset :	0	
Advanced	Tara Phase (?GHz) :	0.00 ?GHz	
	Tara Attenuation (dB) :	0.00 dB	
	Measure configuration :	0	Process type: see code-list
	Range split value :	75	Split value

Current out 1	AO Assign code :	1	Assignment: see code-list
	AO Upper range value :	100.00%	Upper value
	AO Lower range value :	0.00%	Lower value
	AO Current value :	4.00 mA	Live current
	AO Alarm select code :	2	Error current: see code-list
	AO Error current value :	22.00 mA	Error current value
Current out 2	AO Assign code[2] :	0	Assignment: see code-list
	AO Upper range value[2] :	100	Upper value
	AO Lower range value[2] :	0	Lower value
	Range selection[2] :	1	Range
	AO Current value[2] :	4.00 mA	Live current
	AO Alarm select code[2] :	2	Error current: see code-list
	AO Error current value[2] :	22.00 mA	Error current value
Current in 1	AI Enabled :	FALSE	
	AI Range selection :	1	Range: see code-list
	AI Upper range value :	100	Upper value
	AI Lower range value :	0	Lower value
	AI Current :	0.00 mA	Live current
Current in 2	AI Enabled[2] :	FALSE	
	AI Range selection[2] :	1	Range: see code-list
	AI Upper range value[2] :	100	Upper value
	AI Lower range value[2] :	0	Lower value
	AI Current[2] :	0.02 mA	Live current
PT100 input	AI Enabled[3] :	TRUE	
	Pt100 value :	2.8 ℃	Live value
Relay 1	DO Function :	1	Function: see code-list
	DO Assignment :	0	Assignment: see code-list
	DO Threshold :	0.00%	*
	DO Hysteresis :	5.00%	*
Relay 2	DO Function[2] :	2	Function: see code-list
	DO Assignment[2] :	0	Assignment: see code-list
	DO Threshold[2] :	0.00%	*
	DO Hysteresis[2] :	5.00%	*
Digital input	DI Function selection :	0	Function digital input 1
	DI Function selection[2] :	0	Function digital input 2
	DI Function selection[3] :	0	Function digital input 3
	Printout mode :	1	
	Access level :	2	
	Language :	1	
	End of Setup		

Start of Reference Data

System adjustment data:

Product 1:

Mean Atten.:	46.8509 dB
Phase at fm:	42.6285 deg/GHz
Phase offset:	-825.586 deg
Phase slope:	380.984 deg/GHz
Phase sigma:	0.24575

Frequency[GHz]	Phase[Deg]	Atten.[dB]
2.42	96.41	46.2
2.43	100.71	46.8
2.44	103.08	47.13
2.45	108.12	46.84
2.46	111.75	47.28

Start of Sample Data:

Sample Table

Product 1: Sample Data for Concentration 1:

Sample:	Active:	Kon.(%):	Lab.(%):	AIN1(℃):	AIN2(℃):	Temp.(℃):	Phi.(°/GHz):	Att.(dB):
1|16.03 - 20:53	TRUE	50.0193	0	0	0	2.83	-0.1	-0.16
2|17.03 - 00:22	TRUE	50.1061	0	0	0	2.71	-0.56	0.18

Correlation factor between
lab and meas values: 1

End of Sample Data

Do not use following data!