

General, not sorted (yet)

MMI operation

❓ I would like to configure the measurements with the MMI. Is that possible? If not, why is it no longer an option (as opposed to R2k)?

⚠️ A RICTRL module can only be configured with the web interface. Due to its size (2x20 characters, 3 keys), the supplied MMI is very limited and only intended for displaying information and selecting individual service functions, such as rebooting the system. This allowed us to implement the configuration logic only once, and via the web interface the parameter configuration can be guaranteed as most current and the process is very efficient.

❓ Why is the MMI not available in Chinese – as opposed to the web interface?

⚠️ This type of LCD supports only western European and Greek characters. In order to support Chinese characters, a different type of LCD would have to be evaluated and implemented.

Web operation (general)

User administration

❓ The web interface always logs me out after 5 minutes of idle time. Can this time period be changed?

⚠️ No, this period cannot be user-defined. But as a compromise a user can log in again fairly quickly if he/she forgot to log out or closed the browser without prior logout.

❓ I would like to create two users with individual passwords. Where can I define these?

⚠️ The system only supports one user and password. Managing multiple users and exactly tracking changes is not possible with the current configuration structure (and also not practical).

❓ I forgot my password. Can I somehow reset it?

⚠️ Official response: No, the device must be completely reset to the factory settings and the previously saved parameters must be restored from the backup.

Datalog

❓ I cannot properly import datalog files (.txt extension, semi-colon separated format) in Excel! Some numbers are interpreted as text!?? My Windows installation is configured for „Austria“ or „Germany“.

⚠️ Some countries use a comma “,” after a comma delimiter and a period “.” as a thousand delimiter - as opposed to the conventional point and apostrophe notation. Unfortunately, the CSV format is not standardized, i.e. depending on the version Excel uses different procedures to import specially encoded text files. Workaround: in

Excel 2002 in the text conversion wizard, step 3 under „More...“ the decimal and thousands delimiter can be temporarily customized for imports.

❓ Although a Compact Flash card with 128 MB (or more) is installed and guaranteed to be empty, only a portion of this capacity is available?

⚠️ By default, only 90% of the total capacity are available for use; the remaining 10% are reserved for system-internal requirements such as backups, syslogs, etc., and are not available for the user.

❓ How much space does a typical datalog require?

⚠️ See the following table for diagnostic and „normal“ datalog types (approximate values for typical configurations):

Rhythm 1“ diagnosis	1 section 1E4P	4 sections 1E4P
Duration	Total MB	Total MB
10 seconds	0.010	0.041
1 minute	0.056	0.222
1 hour	3.266	13.065
8 hours	26.121	104.485

Rhythm 15' datalog	1 section	4 sections
Duration	Total MB	Total MB
15 minutes	0.002	0.008
1 hour	0.005	0.019
1 day	0.088	0.353
1 week	0.611	2.443
1 year	31.781	127.122

❓ What size datalogs does the supplied Compact Flash card support?

⚠️ The supplied card provides 128 MB of space. Of that, a maximum of 90% are available to the user (i.e. about 115 MB). A datalog with a recording rhythm of 15' requires approximately 32 MB per year. With a maximum of 4 possible sections or datalog tasks the available space of 115 MB will not fully suffice for one year (results in 127.12 MB datalog data).

❓ How can I save datalog files on a USB stick?

⚠️ Yes, with the manual oder automatic copy mode. As an alternative, saved datalogs can also be downloaded via the web interface.

❓ The internet explorer doesn't show all data from a datalog file. What can I do?

⚠️ right mouse click → refresh page ⚠️ Explanation: This is not a bug in the FTP. In fact, it is an expected behavior when certain browsers access FTP sites. They cache the files (store them on disk) and show this cached version every time the file is accessed afterwards, unless the user explicitly requests a new version. The following is a work-around for a different way of accessing files through FTP: To configure IE to request a new version of the file each time, Navigate to Tools » Internet Options. Under Browsing History click the Settings button. Select Every time I visit the

webpage. Select Ok.

<http://digital.ni.com/public.nsf/allkb/7370093A886E021786257434000F28B8>

Parameter backup / restore

❓ Parameter backup does not work. It causes the web interface to freeze.

⚠ Make sure that a Compact Flash card is installed and correctly recognized by the system (EXPERT mode: check the syslog and datalog). If no Compact Flash card is available, an export cannot be executed since the card is used as temporary directory.

Modbus RTU Slave

❓ Contact to RIMOCTRL via Modbus RTU cannot be established.

⚠ Generally, a Modbus channel only has one master (without address) and one or more slaves (with a unique address). For a successful data query, the master must know at which slave address on which register address the desired data is stored. For more information about RIMOCTRL see RISONIC Controller Modbus RTU Slave D22_220_0067750_002_01.pdf

❓ How can I check if the Modbus RTU Slave interface works correctly?

⚠ For test reasons, a standard/off-the-shelf USB to RS485 converter could be used, refer to the following list of typical products:

- http://www.robot-electronics.co.uk/htm/usb_rs485_tech.htm, approx. CHF 30.00
- [MOXA UPort 1130/1130I](#), approx. CHF 92.00
- [Lindy USB RS485 Konverter](#), approx. CHF 49.00
- [Exsys EX-1335HVM, USB zu 1S Seriell RS422/485 Port](#), approx. CHF 118.00

On request, Rittmeyer provides a simple Windows command line program (rimodrw.exe) to generate simple Modbus Master request. Furthermore, errors will show up in the RIMOCTRL syslog.

ModBus RTU Master

❓ My Modbus Slave device (connected to the RIMOCTRL Modbus Master) does not work. Are there any test functions available?

⚠ In the RIMOCTRL web interface simple test functions are available, please refer to each Modbus Slave device (button „test“). Error messages will show up in the RIMOCTRL syslog, too.

❓ If I configure an analogue output on a Phoenix *IB IL AO 1/SF* or *IB IL AO 2/SF* Module the following Message appears in the Syslog „MODBUS_MASTER_ERROR : DPCH Modbus Device (Addr: N) Error: Slave device failure (#13),“

⚠ The „Plug & Play-Mode“ of the Phoenix Modbus Buskoppler must be deactivated. (see „System manual Modbus RTU bus coupler RMILMOD-BK E22_730_0067810_001_02.pdf“) To get the actual setting use: „Input/Output“ → „Modbus Devices“ → „Phoenix Device“ → Test → „Plug & Play“ → Test

? The syslog reports Modbus slave / DC errors after the startup of the system like the following:

```
2012-02-17 11:01:40 dc W MODBUS_MASTER_ERROR : Device driver: run 'action' failed (/tffs0/var/modbus/RAG-MPC_MPJ.lua:64: attempt to perform arithmetic on field 'P_N' (a nil value)) [repeated 2]
2012-02-17 11:01:39 mbh T IISMODULE_F LOGTN SUCCESS : TD:0
```

OR

2012-04-11 15:35:32 dc W MODBUS_MASTER_ERROR: Device driver 'RAG-MPC_MPJ.lua', 'action' failed, 'Modbus Error: 5'

! Modbus slave devices must be powered during the startup of the RIMOCTRL module. This means that these devices may not be powered using 24VDC OUT of RIMOCTRL.

? Siebert display works fine. Why stays the state of RICTRL red?

! first check the configuration, otherwise the RS485-driver of the Siebert display is probably broken.

Parameter Export - Download

? Windows XP with Internet Explorer 8. I did a parameter export, but I'm not able to download the file to my computer. What can I do?

! There are more possibilities to do:

1. use the file explorer for ftp access to your device. For example:
<ftp://192.168.1.1> There are all datas on the cf card so you can copy your export file.
2. or use a download manager (f.e. addon IE7pro)
3. or use another browser (f.e. Firefox)

Under windows 7 and internet explorer 9 the download works correctly.

Inputs/outputs

? I have a 1E1P measurement (one of each RIMOCTRL and RIMOUSTT) and need two analog outputs. How is this possible? A RIMOUSTT only has one analog output!?

! It is true that per RIMOUSTT only one analog output is available. You can add additional RIMOUSTT modules, better (cheaper+more flexible) solutions are suitable Modbus IO modules. If two devices have to be connected to the same analog output (parallel output of the same measuring values), an isolation amplifier with two outputs can be used, too.

? For a special application I would like to output measuring or limit values, measuring value totals, etc. on the analog/digital output that are not yet available on the web interface. Is this possible, and, if yes, how?

! The current RIMOCTRL software version does not support user-defined output devices and rules, but this functionality is integrated. In a later version we plan on incorporating an option to add rules for users with respective know-how. See also [mantis Pendenz 3461](#)

❓ Why do the analog input and output support two current ranges each of 0 to 20mA when the default range is 4 to 20mA?

⚠️ It is required, because for example a fault current of 2.2mA must be output; this becomes clear when configuring the analog output on the web interface.

❓ Which input/output devices are supported with the RIMOCTRL-SW?

⚠️ Beginning from release 2.1.8 the following input/output devices are supported:

Application	Type	RIMOUSTT	IL MOD BK	S102	MPC/MPJ	ICPCON M7017	ICPCON M7022	ICPCON M7067	Seal/O 440M
Limit Value LU	DO	X	X					X	
Limit Value LU INV	DO	X	X					X	
Limit Value LUH	DO	X	X					X	
Limit Value LUH INV	DO	X	X					X	
Flow Direction	DO	X	X					X	
Flow Direction INV	DO	X	X					X	
Impulse	DO	X							
Impulse INV	DO	X							
Error State	DO	X	X					X	
Minor system warnings INV	DO	X	X					X	
Measured value signed	AO	X	X				X		
Measured value absolute	AO	X	X				X		
Display value	D			X					
Measured value absolute	AI	X	X		X	X			
Code Output (bin/bcd/gray)									X

SMS Alarming

❓ Where can I analyse the SMS alarming?

⚠️ On the Diagnostic page from the webinterface:

Explanations:

Status:

- State of the SMS Daemon.

Queued SMS:

- Number of SMS which are in the queue to be sent.

Pending SMS:

- True if there is a SMS in progress but could'nt be send yet.

SMS send retries:

- Number of retries to send a pending SMS.

Sent SMS:

- Number of sent SMS since the last reboot of the SMS daemon.

Timestamp last SMS sended:

- Timestamp of the last sended SMS.

Received SMS:

- Number of received SMS since the last reboot of the SMS daemon.

Received sent status reports:

- Number of sent SMS, with provider confirmation.

Delivered SMS:

- Number of sent SMS, which are delivered to the receiver.

Lost SMS:

- Number of SMS, which couldn't be sent.

Received SMS acknowledges:

- Number of received SMS acknowledges.

Not acknowledged SMS:

- Number of alarms which are not acknowledged.

Accepted SMS queries:

- Number of accepted SMS queries. These queries will trigger a SMS.

Rejected SMS queries (wrong password or key):

- Number of rejected SMS queries. These queries will not trigger any SMS.

SIM PIN error:

- True if the SIM PIN is wrong.

GSM signal quality:

- The signal quality of the modem.
- Expected is an excellent quality between -50dBm and -74dBm.
- Values below -90dBm have not enough signal performance.

GSM network:

- The current network which is used to send and receive data.

GSM registration:

- Shows how the network is registered and whether roaming charges are incurred.

General error:

- True if there is a general error pending.

Timestamp general error:

- Timestamp of the last general error.

Assembly

❓ Mounted on a standard DIN top hat rail (TS35) the RIMOCTRL and RIMOUSTT modules are quite instable!

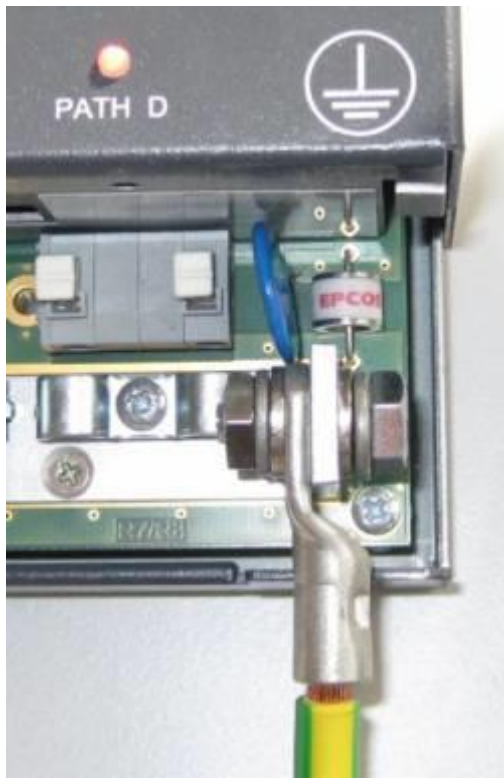
⚠️ This is a known issue of the first series production. The spring clip designed to hold the module on the DIN top hat rail was not manufactured to 100% precision. As a workaround the respective module can be additionally secured with cable ties (using the spring clip holes). The modules are usually sufficiently secured when the wiring is completed. This problem had been remedied for the current production run.

❓ Because of the platform rework, the RICTRL and RIMOUSTT modules got new DIN top hat rail clamps. But they can be hardly mounted!

⚠️ This problem arises due to the usage of not standardized DIN top hat rails (15mm height, clamp-width 28.5mm); standard versions have a height of 7.5mm (standard TS-35-7.5) with a clamp-width of 27mm.

❓ When the ground (16mm²) for the RIMOUSTT is connected to the contact rail, the protective cover may not be mountable.

⚠️ The cable lug must be attached so that the cable runs centered to the bent up side of the contact rail (see the following illustrations):



Network

❓ My PC with a Windows operating system is connected to a RIMOCTRL module via a crossover cable and set to 192.168.1.10/255.255.255.0 per „Alternative Configuration“ in Control Panel/Network Settings/Internet Protocol (TCP/IP). Still, I cannot reliably establish a connection!?

⚠️ Different Windows operating systems (Windows XP, Windows Vista, Windows 7, ...) provide the option of an alternate network configuration in case no DHCP server is reachable on the network (fallback to fixed IP address that is not in the APIPA range). This, however, is not always reliable or with intermediate switches/routers/modems, etc. can lead to unexplainable connection problems (among other things due to additional and variable timeouts). In order to properly establish a connection with a RIMOCTRL module we therefore recommend configuring the network settings via Control Panel → Network Settings → Adapter

Properties → Internet Protocol (TCP/IP) → General not to DHCP/alternative configuration but to a fixed IP address.

❓ After power up the message „ERROR: NET eth0“ appears on the RIMOCTRL MMI, access to the web interface (by means of ethernet/LAN1) is not possible!

⚠️ The error message „ERROR: NET eth0“ indicates that there are duplicate IP addresses in the local LAN1 network. I.e. a second device (personal computer, RIMOCTRL, ...) is configured to the same IP address as the RIMOCTRL Modul, therefore no access to the web interface is possible. Resolve the network conflict!

Parameter configuration

Remote RIMOUSTT modules

❓ Remote individually powered RIMOUSTT modules: after a RIMOCTRL reboot, these will not be recognized/put into operation.

⚠️ RIMOUSTT modules that are not powered via RIMOCTRL (24VDC OUT) must be configured as such in EXPERT mode: EXPERT Mode → Measurement Parameters → RIMOUSTT ID x → Edit → remote = true.

Analogue and digital outputs

❓ How many analogue and digital outputs are possible with a RIMOCTRL module?

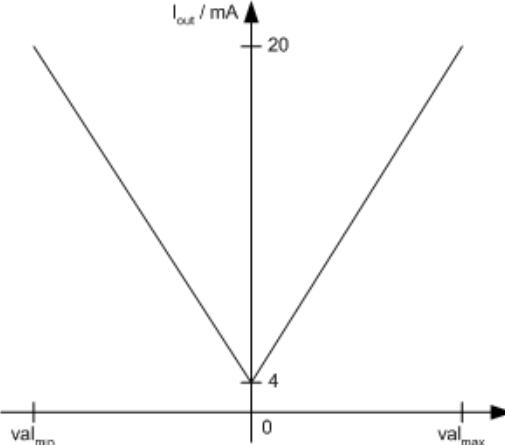
⚠️ A total of 32 so called dispatcher rules are possible per RIMOCTRL module, shared onto 1-5 RIMOUSTT modules (AO, DO) and 1-10 Modbus devices.

❓ Which applications are possible with the analogue and digital outputs (i.e. with these dispatcher rules)?

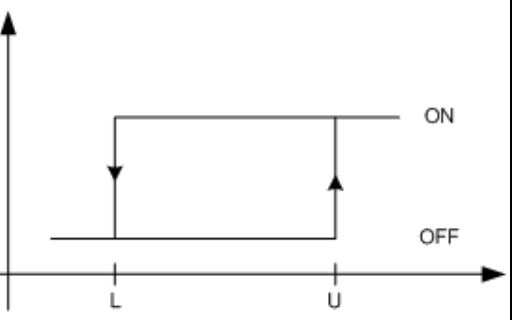
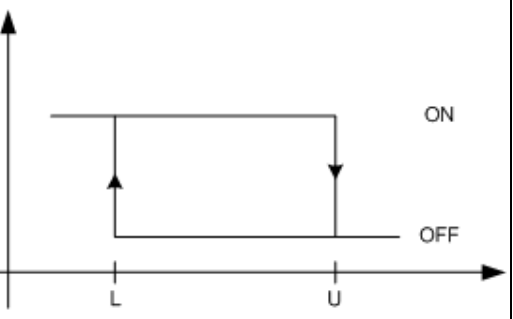
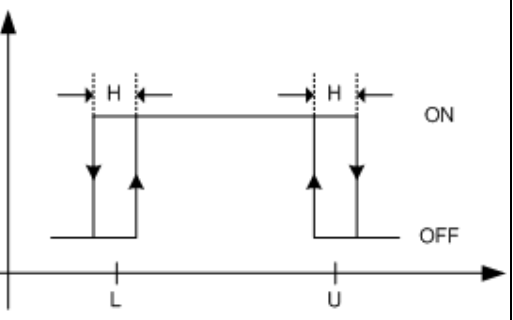
⚠️ The following applications are possible:

Analogue outputs:

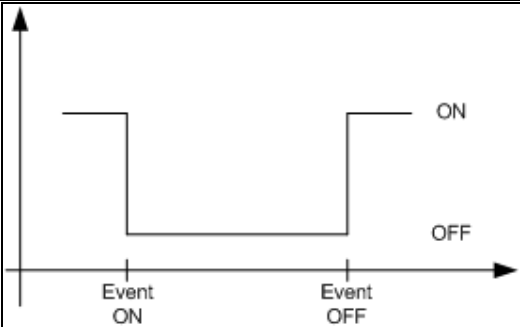
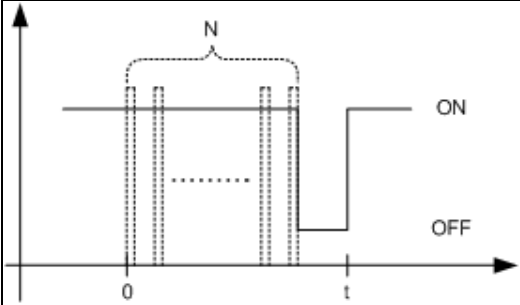
	Applications	Possible output values	Additional settings
Measure Value Signed		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • AI_raw • ampl • gain 	<ul style="list-style-type: none"> • values for 4 and 20 mA • error current (default 2mA) • saturation on/off • damping (off, 2, 3, 5, 7, 10, 15, 20, 30, 60s)

<p>Measure Value Absolute</p>		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • Al_raw • ampl • gain 	<ul style="list-style-type: none"> • values for 4 and 20 mA • error current (default 2mA) • saturation on/off • damping (off, 2, 3, 5, 7, 10, 15, 20, 30, 60s)
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Digital outputs:

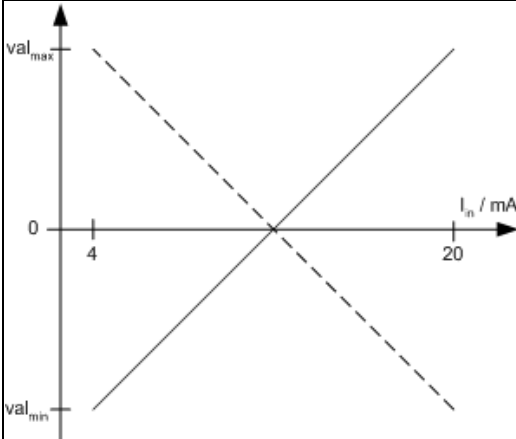
	Applications	Possible output values	Additional settings
<p>Limit Value LU</p>		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • ampl 	<ul style="list-style-type: none"> • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)
<p>Limit Value LU INV</p>		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • ampl 	<ul style="list-style-type: none"> • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)
<p>Limit Value LUH</p>		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • ampl 	<ul style="list-style-type: none"> • Hysteresis • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)

Limit Value LUH INV		<ul style="list-style-type: none"> • Q • vm • Tm • cm • H_ext • Q_ext • T_ext • v_ext • ampl 	<ul style="list-style-type: none"> • Hysteresis • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)
Flow Direction		<ul style="list-style-type: none"> • Q • vm 	<ul style="list-style-type: none"> • Hysteresis • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)
Flow Direction INV		<ul style="list-style-type: none"> • Q • vm 	<ul style="list-style-type: none"> • Hysteresis • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)
Impulse		<ul style="list-style-type: none"> • Vf • Vr 	<ul style="list-style-type: none"> • Pulse Time = 100ms, 200ms, 1000ms)
Impulse INV		<ul style="list-style-type: none"> • Vf • Vr 	<ul style="list-style-type: none"> • Pulse Time = 100ms, 200ms, 1000ms)
Error state INV		<ul style="list-style-type: none"> • Q • Path state • Any path state 	<ul style="list-style-type: none"> • State ERROR INV or WARNING INV • Damping (off, 5, 10, 15, 20, 30, 45, 60, 120s)

Minor system warnings INV		<ul style="list-style-type: none"> • USB connected • Measurement stopped • Datalog disk full • IEC-104 connection closed 	
Minor system warnings INV		<ul style="list-style-type: none"> • Weblogin invalid password • Syslog entries • SNMP Errors • Modbus Errors 	

Analogue inputs

- ❓ How many analogue inputs are possible with a RIMOCTRL module?
- ❗ A total of 32 so called data collector rules are possible per RIMOCTRL module, shared onto 1-5 RIMOUSTT modules (AI) and 1-10 Modbus devices.
- ❓ Which applications are possible with the analogue inputs (i.e. with these data collector rules)?
- ❗ The following applications are possible:

	Applications	Possible input values	Additional settings
Absolute measurement value		<ul style="list-style-type: none"> • H_ext • Q_ext • T_ext • v_ext • AI_raw 	<ul style="list-style-type: none"> • values for 4 and 20 mA • error current • damping (off, 2, 3, 5, 7, 10, 15, 20, 30, 60s)

Software update

- ❓ For the software update, I am supposed to set the rotary mode switch to 'F' but cannot find the 'F' position on the module.
- ❗ The rotary switch supports sixteen settings. To save space not all positions are

marked (hexadecimal characters). The 'F' position is located between 'E' and '0' (indicated by a small dash).

❓ After the software update, the RIMOCTRL software does not start, and the message „Can't load image“ (or similar) is displayed on the MMI.

⚠️ This error message can occur when the software was updated from a version 1.8.x to 1.9.x/2.0.x and the onboard Flash was not formatted (the newer [VxWorks](#) BSP requires different mapping of the Flash EPROMs). Therefore, the onboard Flash can be formatted in 'F' mode with the help of a hidden option. Afterwards, the software must be reinstalled:

- Start RIMOCTRL with the rotary switch set to 'F' and wait until the MMI displays „Software update - PRESS OK to continue“.
- Press the right arrow key when the message „FORMAT int. FLASH? PRESS OK to format“ is displayed. Click „OK“. A progress bar is displayed.
- Formatting will be completed after approximately 90 seconds. Click „OK“ to activate the FTP server.
- Reinstall the software

❓ The Bootrom update fails consistently („Can't load image“ or similar) even though I am sure that all network settings were correctly configured, the Bootrom FTP server „brdftpd.exe“ launched, and the firewall disabled.

⚠️ This phenomenon has been observed repeatedly; in laptops, for example, the wireless connection can interfere (disable temporarily to remedy this issue), or if the computer has a network connection exceeding 100/1000BaseT, the default routes may be set incorrectly (cause is unclear, countermeasure: enter and execute „route -f“ and „ipconfig /renew“ in the command prompt). Above all, be sure that the TCP/IP settings of the Ethernet interfaces (IP address, subnet mask) are configured correctly and that the RIMOCTRL is accessible via ICMP Ping.

Accessories

Hardware

❓ Which products can be used to add an additional galvanic isolation to the RS-485 interfaces?

⚠️ E.g. Westermo RD-48,
<http://www.westermo.com/Resource.phx/content/products/converters-repeters/converters-repeters/rd-48.htx>

❓ Suitable RS-485/fibre optic converter?

⚠️ Westermo ODW-631,
<http://www.westermo.com/Resource.phx/content/products/fibre-optics/odw/odw-631.htx>. ODW-631 settings:

- 9600 baud, even parity, 11 bits.
- 2-wire fail-safe termination off (if connected to a modbus master)
- 2-wire fail-safe termination on (if connected to a modbus slave)
- cable connection:
 - RIMO RS485 A ↔ ODW-631 RS485 pin 4 T/R-

- RIMO RS485 B ↔ ODW-631 RS485 pin 3 T/R+

Application RISONIC modular

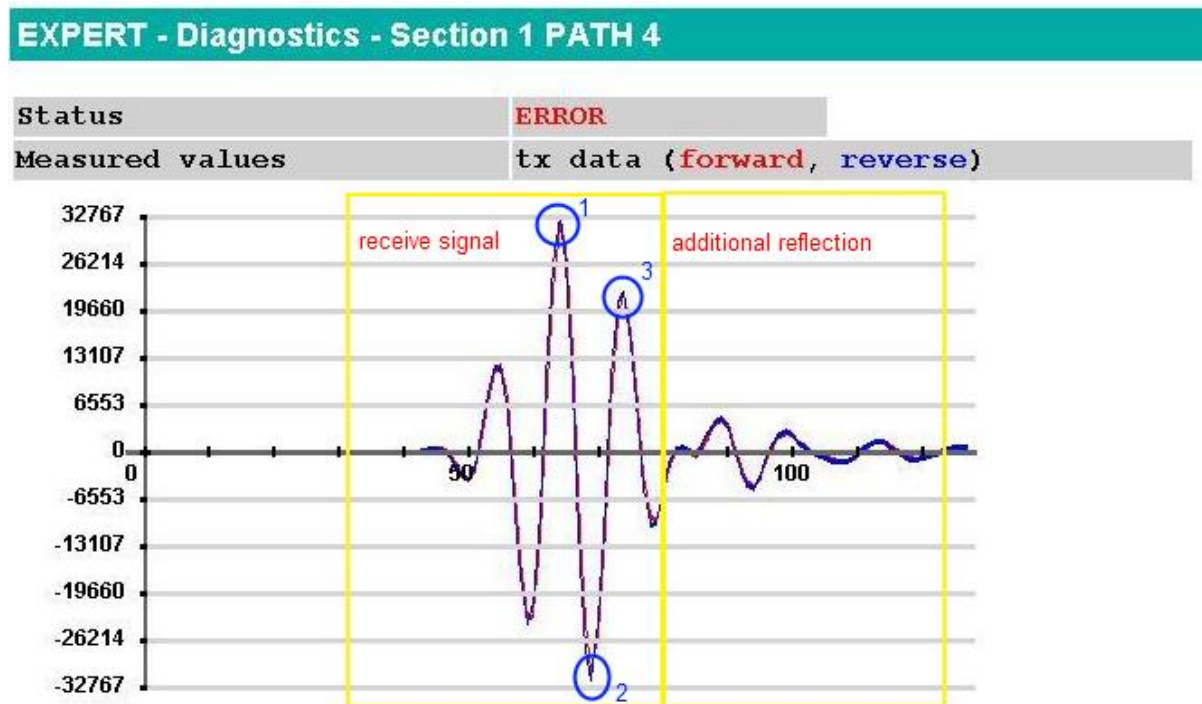
- ❓ I need instructions on how to perform IEC 41 certification tests!
- ⚠️ A description can be found in the [TechDok](#): ENGLISH → DG22 FLOW MEASUREMENT → E830 Fault Diagnosis → RISONIC Controller IEC 41 checks E22_830_0067750_001_01.pdf.

Diagnostics

Path errors

- ❓ Although a receive signal is available and shown in the path diagnostics, the system still shows path errors?
- ⚠️ If there is a receive signal but the system shows path errors for this path this most probably means that limit values are not met i.e. exceeded due to tight parameter settings. See EXPERT Mode → Measurement Parameters → Section x → General.

As an example, refer to the following receive signal:



On this receive signal, the additional reflections after the first positive and negative peaks (1, 2, 3) can be a problem. This may lead to preprocessing and/or correlation errors.

There are several possibilities to solve this:

- reduce the parameter `n_loc_mm`, e.g. set it to 2. With this, only two pairs of positive and negative maximums will be supervised, peaks occurring later will

not be used for the signal supervision. Advantage: the correlation still uses the complete signal and is more robust.

- cut-off the reflexion with `n_zero_cross`, e.g. set it to 3. With this at the given number=zero cross after the global peak, the signal will be set to zero.
Disadvantage: the correlation will use a smaller signal and is more sensitive to correlation errors.

This change will lower the characteristic value „PREPROCESS INVALID“ significantly.

Features

Datalog

? What is the meaning of „state_tt_forward/state_tt_reverse“?

! If `state_tt_X` is smaller than 1024 then the value is a bit pattern

Bit	Wert	Flag	Beschreibung
0	1	state_path_ns	no signal
1	2	state_path_sl	received signal to small
2	4	state_path_sh	received signal to high
3	8	state_path_of	overflow
4	16	state_path_cbe	cut border end
5	32	state_path_cbs	cut border start
6	64	state_path_mm	Minimum/Maximum
7	128	state_path_dch	dc-offset to high

Multiple bits may be set.

If the value of `state_tt_X` is larger or equal 1024 then the following table is valid:

Wert	Flag
0	OK
1024	calc_preproc_absmaxpos
1025	calc_preproc_maxpos
1026	calc_preproc_dc_hi
1027	calc_preproc_dmm_oor
1028	calc_preproc_dmax_lo
1029	calc_win_cbs
1030	calc_win_cbe
1031	calc_corr_min_gt_max
1032	calc_corr_d_hi
1033	calc_corr_uncert
1034	calc_corr_asym_oor
1035	calc_interp_dt_oor
1036	calc_t_raw_tf_d_oor
1037	calc_t_raw_tr_d_oor

1038	valid_abstime_tf_oor
1039	valid_abstime_tr_oor
1040	valid_abstime_c_raw_oor
1041	valid_abstime_dt_calc_oor
1042	valid_deltatime_v_oor
1043	valid_deltatime_d_v_hi

In this case only one value will be shown. This is the first error detected in the processing chain.

Volume counter

? With the RISONIC 2000 it was possible to start the volume counters from the last saved value after a power failure or restart. How can I configure this option in the RISONIC modular?

! This issue has been solved with RIMOCTRL-SW release 2.1.8:

- All volume counters are persistently stored in 5 minute intervalls (indefinite time of storage, even while unpowered).
- If the RIMOCTRL module is shut down (or restarted) by web interface, mmi or sleep mode all volume counters are stored with their actual value.
- If the RIMOCTRL module is abruptly unpowered the actual values can't be stored. In this worst case the volume counts of the last 5 minutes are lost (limitations of the used realtime operating system).

? Min./Max. volume counter value? Automatic reset?

! +/- 10E20. No automatic reset.

Channel – free form

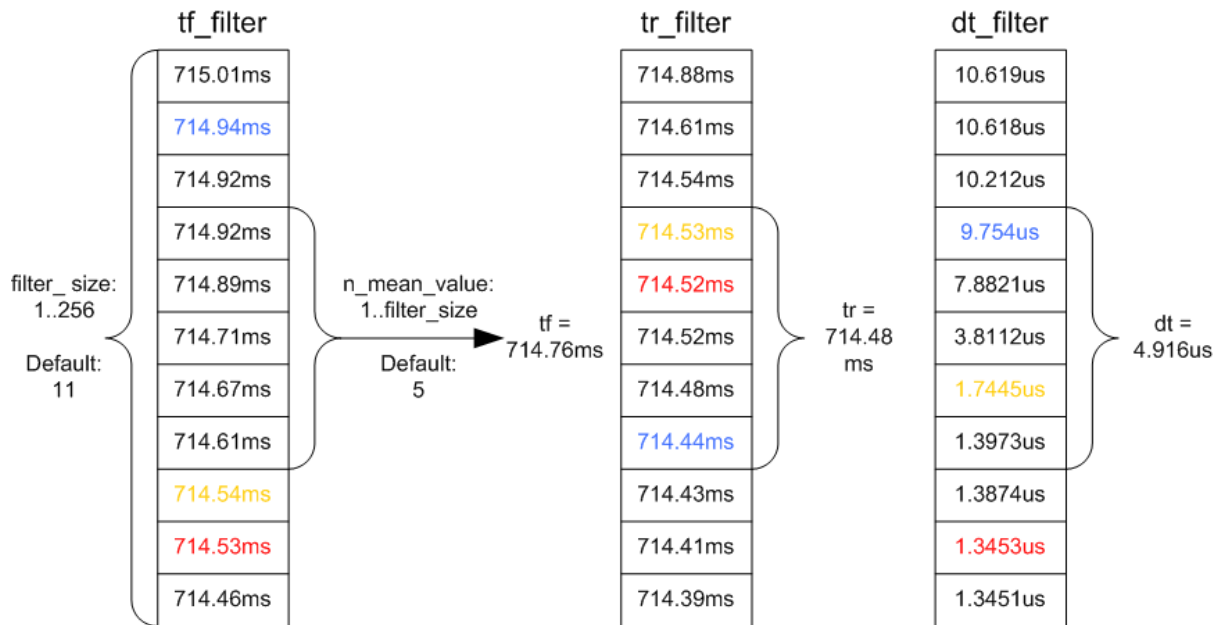
? For the RISONIC 2000, a minimum of two paths with varying installation height were required for channels with a user-defined geometry (free form). Does this apply to the RISONIC modular as well?

! No. RISONIC modular supports all geometry forms starting with at least one path.

Measured value filtering

? Although the RIMOCTRL software performs, validates, and filters up to 50 individual path measurements per second, hydraulic measured values are output in one-second intervals. Can I influence the filtering process for the individual path measurements?

! This is possible with the outlier filters described in the following: Three independent outlier filters are implemented for the transit times (tf_filter, tr_filter) and differential transit times (dt_filter). In a defined period of time, a maximum of filter-size valid (state_tt) and current (valid_time) measured values are searched in all buffers (per measuring point and path) in descending order, sorted by size and copied into the respective outlier filters.



Depending on the number of found valid and current times (max. number: filter_size), the size of the outlier filter or mean filter is dynamically determined in relation to the transit time, and the filtered transit times t_f and t_r and the differential transit time are calculated by means of the outlier and/or mean value generation n_mean_value . The following configurations are supported: (These values can differ per measuring point)

- **buffer_size:** Size of the buffer
- **valid_time:** Definition how current a measured value must be for it to still be accepted as valid.
- **filter_size:** Maximum size of the outlier filter
- **n_mean_value:** Maximum size of the mean value generator.
- **n_value_min:** Minimum number of valid values required to initiate a filtering process.

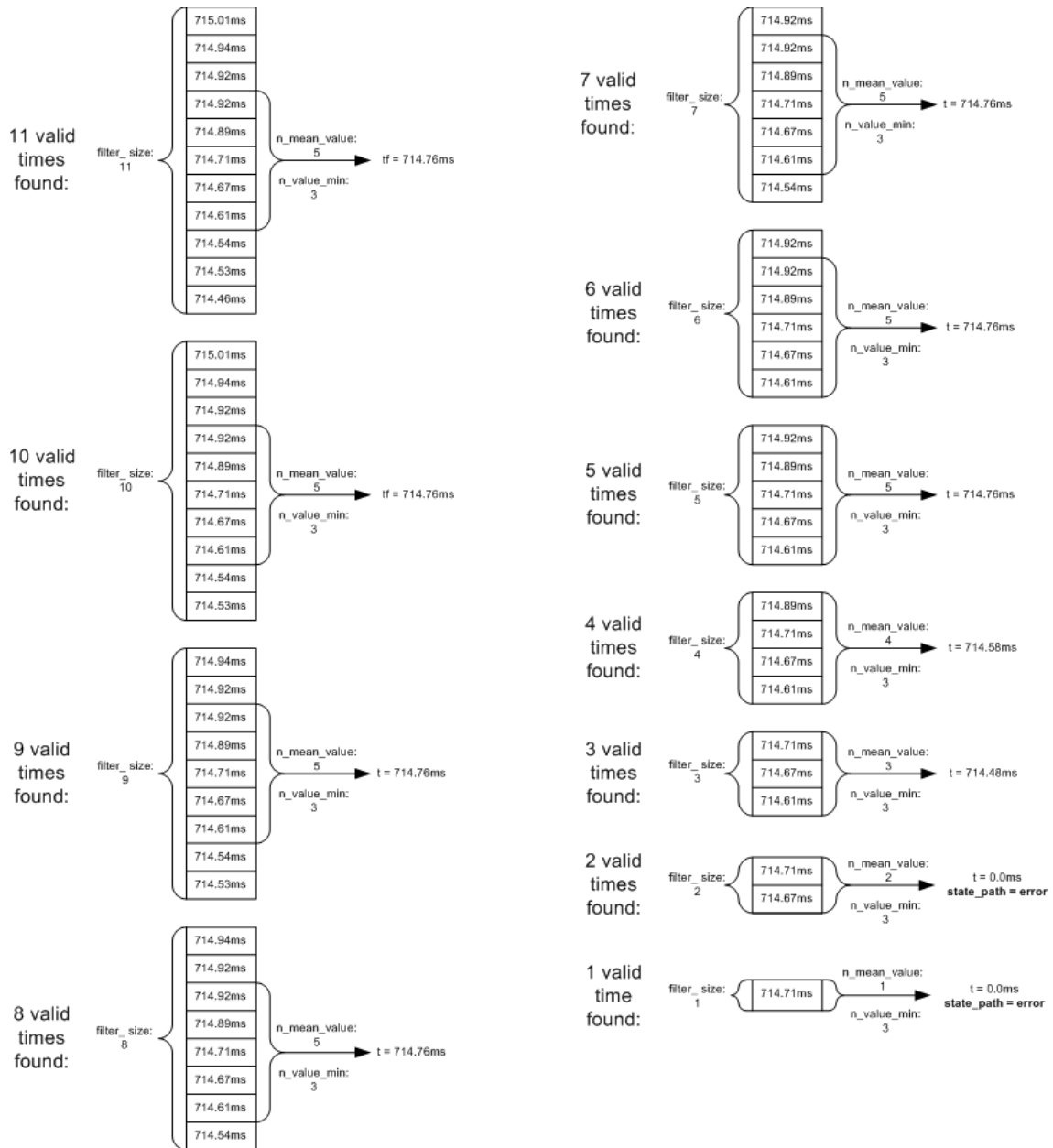
Depending on the configuration, the temporal behavior of the calculation portion can thus be modified. When selecting parameters, the following factors must be considered:

1. The length of time until a valid flow is output after a system start
2. The length of time until a changed flow is output
3. The reaction time until a measuring error is recognized by the system

The default settings for a filled pipe are as follows:

- **buffer_size** = 256
- **valid_time** = 5s
- **filter_size** = 11
- **n_mean_value** = 5
- **n_value_min** = 3

Example: Thus, for the default configuration, the following outlier or mean filter variants are available:



Pipe-Integration CALC/FIX

❓ What is the meaning of the „PIPE WEIGHTINGS CONTROL“ setting in the menu „EXPERT - Measure Parameters - Geometry“?

⚠️ The settings CALC and FIX are possible

- CALC: The Integration-Weights will be calculated for every hydraulic calculation. This requires the d_{layer} , the H and the Integration-Method (Gauss-Jacobi, OWICS...) parameters. In addition this makes the system computing the Integration-Weight w when changing the layer- and path-parameter.
- FIX: The calculation uses the Integration-Weights configured in the Layer-Section of the Expert mode. With this mode the path- and layer-weights will not be updated on changes in these sections.

Path replacement strategy

? How does the path replacement strategy work?

! The RISONIC modular path replacement strategy replaces failed paths with working paths; i.e. the velocity of available and suitable paths are used for the flow calculation, instead of failed ones (section status → WARNING):

- non-crossed measurements 1ExP: mirrored on middle horizontal layer of the cross section geometry, the mirrored path will be used (example 1E4P, lowest path fails → velocity of the top most path is used instead of the failed path)
- crossed measurements 2ExP: same horizontal layer, the remaining and correctly functioning path will be used (example 2E8P, lowest path left fails → velocity of the lowest path right will be used instead of the failed path)

With several path failures, combinations of the above mentioned alternatives are used; the system keeps trying to measure the flow. At least one path velocity must be available per horizontal layer, otherwise no measurement is possible (section status → ERROR).

QSIModular

? I configured a multi-section measurement of two 1E4P pipes on one RIMOUSTT each which is simulated by a QSIModular, and I observe irregular section and path failures and measuring errors.

! A QSIModular cannot simulate multi-section measurements with more than one RIMOUSTT module. For multi-section measurements one RIMOUSTT and one QSIModular must be used per section.

Accessories

? What are the specifications for the RISONIC modular coaxial cable?

! Basically, the coaxial cable used standard RG59 type cable encased in PUR sheathing. The most important electric parameters include 75 ohm wave impedance, approx. 66pF/m capacity, and a negligible attenuation at 1MHz. The outer diameter of the coaxial cable is very important as the used cable glands perfectly fit onto this cable (pressure resistance).

? RISONIC modular rimo spy: For example, when trying to monitor individual paths (curves, characteristic values) in a 16-path configuration, path failures occur. This, however, happens only as long as the spy is activated. How can I circumvent this?

! Before activating 'Auto Start', set the 'Interval' in 'display_control' to 2 seconds since the additional network traffic puts heavy strain on the system.