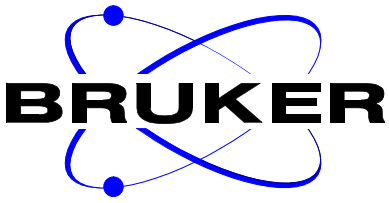

QNP Accessory

For BLAXH300/100 200-600MHz
Operating & Service Manual

Version 001

The information in this manual may be altered without notice.

BRUKER accepts no responsibility for actions taken as a result of use of this manual. BRUKER accepts no liability for any mistakes contained in the manual, leading to coincidental damage, whether during installation or operation of the instrument. Unauthorised reproduction of manual contents, without written permission from the publishers, or translation into another language, either in full or in part, is forbidden.

This manual describes the units as they are at the time of printing. On request, the manufacturer shall supply circuit diagrams, lists of components, descriptions, calibrating instructions and any other information for use by qualified personnel of the user, in charge of repairing the parts of the unit which have been stated by the manufacturer to be "repairable". Such supply shall in no event constitute permission to modify or repair the units or approval of the same.

This unit is not designed for any type of use which is not specifically described in this manual. Such use may be hazardous.

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DWG-Nr: 1364.001

Contents

Contents

General information 1

Introduction 1.1

The BLAXH300/100 200-600 ACCESSORY is an RF routing system accessory specifically suited for use on BLAXH300/100 200-600MHz amplifier.

This accessory allows to dispatch the power of both channels (^{1}H amplifier channel & X amplifier channel) through three outputs: 1H, 19F & XQNP.

This accessory (19" and 45mm height) is supplied and driven by the BLAXH300/100 200-600 amplifier through a specific front panel accessory socket.

Two "BNC" sockets in front panel receive "real time" switching signals.

Figure 1.1. QNP accessory combined with an amplifier BLAXH300/100

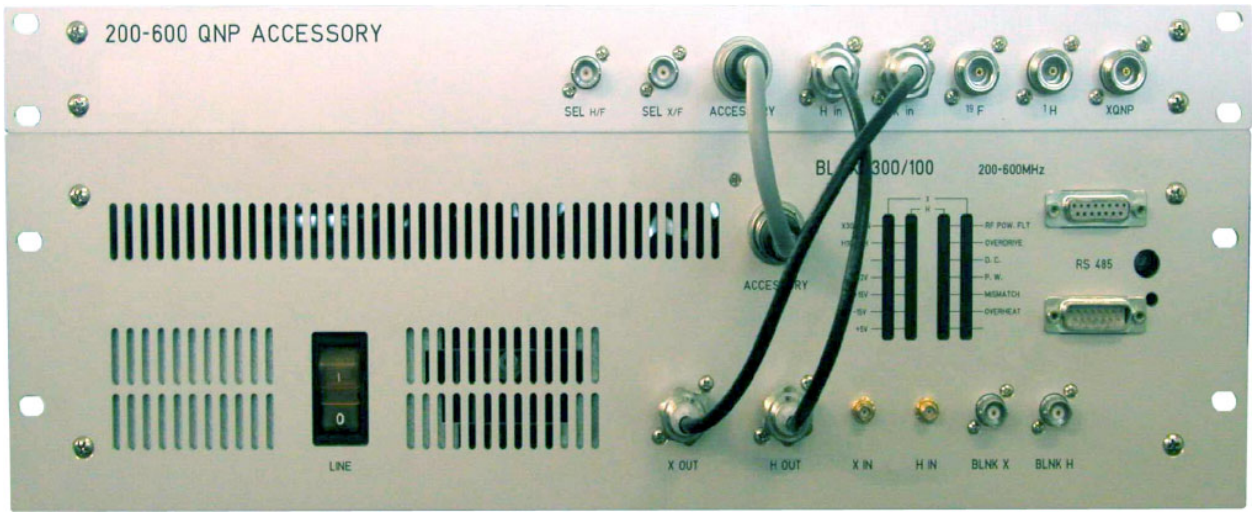
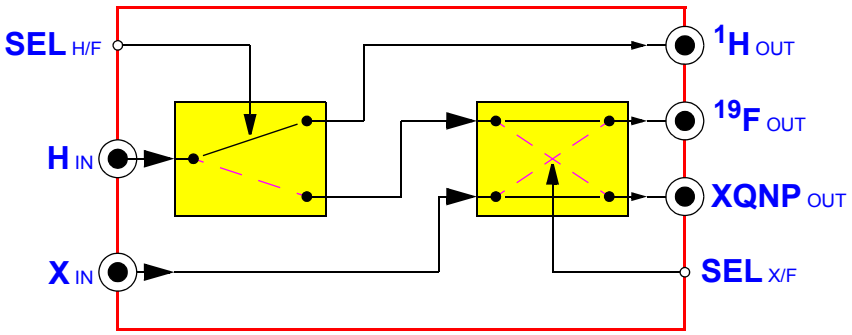


Figure 1.2. Internal routing diagram



Safety 2

Labels 2.1

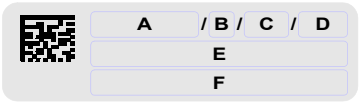
Labels are provided to alert operating and service personnel to conditions that may cause personal injury or damage to the equipment from misuse or abuse. Please read the labels and understand their meaning.

Dangerous area 2.1.1

WARNING ! *High Voltage, when the device operates. This device is low voltage supplied (+15V) but high power RF transiting signals generate high voltages.*

Name plate 2.1.2

The QNP Accessory serie can be identified by a name plate at the front panel of the unit which has following information:



- **(A) Part Number**
  This field indicates the assembly number which identifies the part number of the product.
- **(B) Variant**
  This field indicates the variant number which identifies the production category of the product. The default variant is 00.
- **(C) ECL**
  This field indicates the revision number which identifies the product configuration. The initial revision is 0.00.
- **(D) Serial Number**
  This field indicates the manufacturing number which identifies the serial number of the product.
- **(E) Type**
  This field contains the designation of the product.
- **(F) Information**
  This field contains information about the frequency range in witch it fonctions.

Installation 3

Initial inspection 3.1

Mechanical check 3.1.1

If damage of the shipping carton is evident, request the carrier's agent be present when the instrument is unpacked. Check the equipment for damage and inspect the cabinet and panel surfaces for dents and scratches.

Claim for damage 3.1.2

If the unit is mechanically damaged or fails to meet specifications upon receipt, notify BRUKER or our representative immediately. Retain the shipping carton and packing material for the carriers inspection as well as for subsequent use in returning the unit if necessary.

Reshipment and repackaging requirements 3.1.3

Whenever possible, the original carton and packing material should be used for reshipment. If the original packing material is not available, wrap the instrument in heavy paper or plastic. Use a strong shipping container. If a cardboard is used, it should be at least 200 lbs. test material.

Use shock absorbing material around all sides of the instrument to provide a firm cushion and to prevent movement inside the container wall on each side. Protect the front panel by means of cardboard spacers inserted between the front panel and the shipping carton. Make sure that the instrument cannot move in the container during shipping. Seal the carton with a good grade of shipping tape and mark the container:

" FRAGILE ELECTRONIC INSTRUMENT."

Auxiliary kit 3.1.4

The QNP Accessory is shipped with an accessories kit containing following items:

- The QNP Accessory,
- The supply cord and RF wire cords set,
- The Operating & Service Manual

The QNP Accessory ans its cord set are commercialized under the same Part Number: W1345201.

Installation requirements 3.2

No special precautions are necessary. Mount the equipment in an area which is relatively free of vibration, and has sufficient room for cable connections.

Bench operation 3.2.1

The units can be placed onto a secure flat surface.

Cooling and ventilation 3.2.2

No specific cooling or ventilation is required. It should, however, be in an environment which conforms the 0°C to 50 °C (32 °F to 158 °F) specification, and in an area that does not obstruct the free flow into and out of the unit.

Power requirements 3.3

The QNP Accessory (P/N: W1345201) is designed to be powered by the BLAXH300/100 RF Amplifier 200-600MHz (P/N: W1345062).

The connection to this power supply is realized via the seven pins socket cord from the auxiliary kit.

System Check 3.4

Before applying RF power for the first time the following items should be checked:

The "in use" RF output of the accessory must be wired.

Two external "real time" signals must drive the both selection inputs (SEL H/F & SEL X/F).

Don't omit to wire the two RF outputs from the amplifier to the RF inputs of the accessory (use the two "N" to "N" auxiliary kit cords).

Initial Turn On Procedure 3.5

The following list describes how to turn on the BLAXH300/100 200-600MHz and what should be seen as this occurs.

Before starting this procedure, make sure that you have properly followed instructions in the ***"System Check" on page 10***.

1. Connect the amplifier to the power supply and turn the circuit breaker, to ON.
2. Observe the indicators on the front panel of the power supply:
   - The five channels +28 V (+30 V) ON LED's will illuminate.
   - The +15 V, -15 V and +5 V ON LED's will illuminate.

3. Observe the indicators on the front panel of the amplifier:
   - The +30 V, +15 V , -15 V and +5 V ON LED's will illuminate.
4. The system is now fully operational.

QNP Accessory operation

4

Front panel 4.1

The QNP Accessory front panel is provided with two "BNC" selection connectors, five "N" RF power sockets (two for inputs and three for outputs) and a 7 pins interface connector.

Indicators 4.1.1

No indicators on front panel. Power states are on front panel of BLAXH300/100 200-600 indicated.

Connectors 4.1.2

RF connectors

The following table describes the RF inputs and outputs

Table 4.1. RF connectors assignment

X in	RF in for 300W X channel (female N connector).
H in	RF in for 100W H channel (female N connector).
^{1}H	^{1}H RF out (female N connector).
^{19}F	^{19}F RF out (female N connector).
XQNP	XQNP or QNP RF out (female N connector).
SEL H/F	SPDT Switch for H in to ^{1}H or ^{19}F Outputs TTL logic 5 V => H in to ^{1}H TTL logic 0 V => H in to ^{19}F
SEL X/F	DPDT Switch for H in & X in to ^{19}F & XQNP Outputs (direct or reverse) TTL logic 5 V => direct wire mode: H in supplied to ^{19}F (if SEL H/F is low) X in supplied to XQNP TTL logic 0 V => reverse wire mode: H in supplied to XQNP (if SEL H/F is low) X in supplied to ^{19}F

7 pins connector

The connector is used to supply the QNP Accessory device (+15 V & GND) and feeds QNP Accessory configuration bits to the RF amplifier.

Two bits are used to feed the 2 bits are used to indicate the presence or the absence of the SPDT and the DPDT switches.

A bit is wired to ground if the corresponding switch is present.

The following table describes the RF inputs and outputs

Table 4.2. 7 pins connector assignment

Pin 1	Not used
Pin 2	Power supply ground
Pin 3	Bit 5 (^{1}H / ^{19}F SPDT presence bit)
Pin 4	Bit 0 (QNP DPDT relay presence bit)
Pin 5	Power supply +15 V
Pin 6	Not used
Pin 7	Digital ground

Figure 4.1. 7 pins connector front view

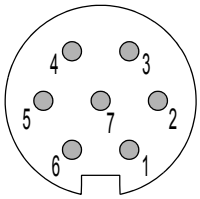


Figure 4.2. QNP Accessory front panel design

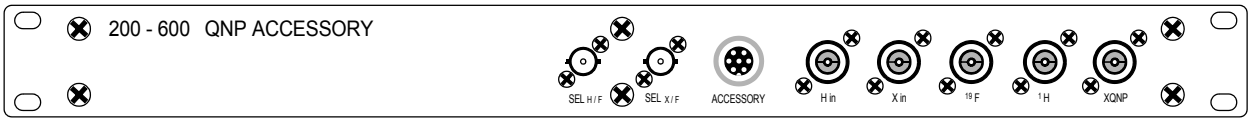


Figure 4.3. QNP Accessory front panel view

Rear panel *4.2*

The rear Panel of the QNP Accessory is free of elements.

Technical description

5

System overview 5.1

The QNP Accessory requires an additional Bruker RF Power Amplifier BLAXH300/100 200-600MHz (P/N: W1345062) to provide:

- A RF X output above 300W on XQNP or ^{19}F outputs, over the full frequency range 6 to 365MHz, when selected for XQNP or ^{19}F operation with SEL X/F command controlled at TTL high level for XQNP and TTL low level for ^{19}F.
- A RF ^{1}H / ^{19}F output above 100W on ^{1}H or ^{19}F outputs, over the full frequency range 200 to 600MHz, when selected for ^{1}H or ^{19}F operation with SEL H/F command controlled at TTL high level for ^{1}H and low level for 19F.

The first RF SPDT section of the system consists of a PIN SPDT switch. This switch feeds the RF power from H Input on one of the two outputs cases. Without SEL H/F command (or TTL level 1) directly to ^{1}H front panel output. It's the normal use in ^{1}H NMR operation. This output is connected to the ^{1}H preamplifier channel.

By setting SEL H/F command to low (TTL level 0) the RF signal is fed to the input of the DPDT transfer relay switch.

By setting SEL X/F command to high (TTL level 1) the RF signal is fed to ^{19}F front panel output. By setting this command to low, RF signal is fed to XQNP front panel output as such QNP mode.

X channel is only concerned by the DPDT relay switch.

By setting SEL X/F command to high (TTL level 1) the RF signal issued from X Input is fed to XQNP front panel output.

By setting this command to low, the signal arrives on ^{19}F front panel output. This case of use is suited for special experiments like the use of a triple resonance probe.

Applications 5.2

This accessory is meant to be used with a QNP (^{1}H / ^{19}F / ^{13}C / ^{31}P) or a TXO (^{13}C / ^{19}F / ^{1}H) probe and a single BLAXH300/100 amplifier.

It allows to commute the ^{1}H output of the amplifier from the ^{1}H preamplifier to the ^{19}F or the QNP preamplifier. This system allows to record ^{1}H {^{19}F} (pulse program: zghfigqn) or ^{19}F {^{1}H} experiments (pulse program: zgfhigqn) and to record in automation 1D ^{19}F, ^{13}C and ^{31}P spectra on a QNP probe with a single BLAXH300/100 amplifier.

Spécifications 6

General specifications 6.1

Table 6.1. QNP Accessory specifications

RF Specifications	H Section	X Section
Frequency Range	188 to 600 MHz	6 to 325 MHz
Insertion Loss	1 dB ± 0.25 dB	0.2 dB ± 0.15 dB
Gain Flatness	0.6 dB ± 0.2 dB (50 Ω terminated)	0.2 dB ± 0.15 dB (50 Ω terminated)
Length Pulses Output	100 W min. (100 ms/1 s: D.C.=10%)	350 W min. (100 ms/1 s: D.C.=10%)
CW Output Power	15 W max. (180 MHz to 650 MHz)	40 W max. up to 325 MHz
Switching Delay	< 5 µs typ.	< 20 ms typ.
DC Ringing	< ± 1 V & < 500 ns	
IN/OUT Impedance	50 Ω	50 Ω
Input V.S.W.R.	1,2 max.	1,15 max.
Selection Inputs	^{1}H / ^{19}F SEL: TTL in	X / ^{19}F SEL: TTL in
Power Supply (external via BLAXH amplifier)	DC 15 V @ 500 mA max.	
Usage Temperature	+10 °C to +35 °C	
Storage Temperature	-15 °C to +60 °C	
Housing	19" x 1U heigh rack & 290 mm depth	
Weight	3 kg	

Spécifications

Figures

Figures

Tables

Tables