



User's guide



Vibration Monitoring System Adash 3600

Application:

- ✎ Vibration diagnostics, monitoring and protective on-line system
- ✎ On-line vibration monitoring system of engines, fans, pumps, gearboxes, turbines ...
- ✎ Machines monitoring system with outputs to measuring and feedback systems
- ✎ On-line system with possibility of temporary installation on problematic machines

Characteristics:

- ✎ Measuring of TRUE-RMS and TRUE-PEAK values, time signals and signal spectrum
 - LF velocity mm/s in the band 10 - 1000 Hz
 - LIN acceleration g (9.81 m/s^2) in the band 0.8 Hz - 16 kHz
 - HFE acceleration gHFE in the band 5 - 16 kHz (bearing condition)
 - ENV envelope g in the band 5 - 16 kHz (bearing condition)
- ✎ Possibility to start measurements by an external trigger signal
- ✎ Possibility of a vibration limit values setting to close indicating and protective relays
- ✎ Output of measured static data on current loops 4 - 20 mA
- ✎ Clearly visible display of measured static data
- ✎ Easy connection to control and feedback systems
- ✎ Indication of an overloading and a sensor defect or a measuring channel error
- ✎ Easy mounting on DIN rail
- ✎ Possibility to connect to an information network - TCP/IP protocol
- ✎ On-line or off-line data transferring to the Adash DDS 2000 software
- ✎ Possibility to extend the set with additional Adash 3600 modules



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Before the First Start-up

***Failure to respect any of the following recommendations may damage the device!
With a non-professional handling of voltage exceeding 24 V you expose yourself to
accident hazard.***

- 1. Never connect any sensor to the ICP input of the unit other than the ICP sensor type!
If you are not sure, consult the procedure with your supplier.**
- 2. Never connect the unit directly to the mains voltage!**
- 3. Use only power supply units with a maximum nominal voltage of 5 V DC to supply the unit!**
- 4. Use only power supply units with a maximum nominal voltage of 30 V DC to supply current loops and binary inputs!**
- 5. Pay attention to the correct polarity of the supplied voltage!**

Terminal Board of the Adash 3600-MAIN Module

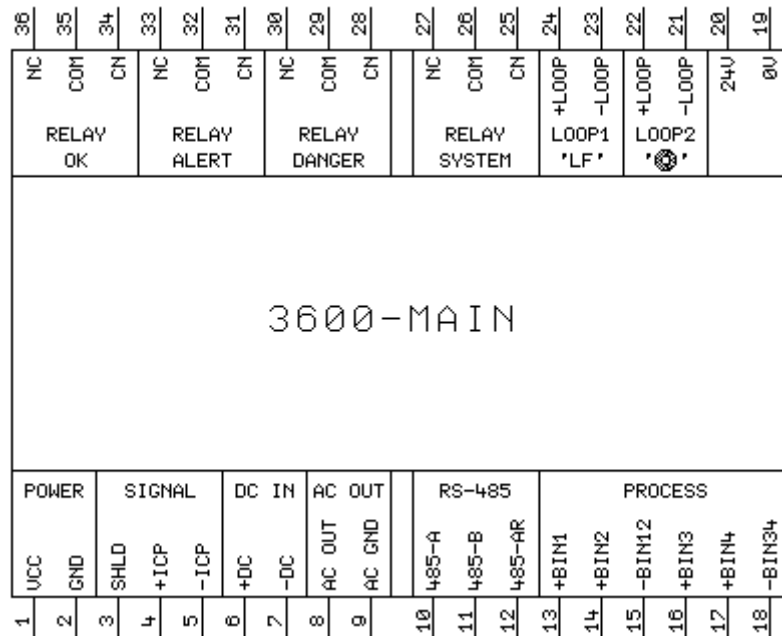


Fig. Terminal board of the Adash 3600-MAIN module

The display of the terminal board corresponds to the front view of the module.

Description of Terminal Connectors

| | |
|---------------|---|
| POWER | supply voltage: |
| VCC | +5 V / 0.5 A, |
| GND | 0 V. |
| SIGNAL | connection of vibration sensor (or OUT output of the Adash 3600-MPX module): |
| SHLD | vibration sensor cable shield, |
| +ICP | vibration sensor ICP input, positive pole, or +OUT output of Adash 3600-MPX, |
| -ICP | vibration sensor ICP input, negative pole, or -OUT output of Adash 3600-MPX. |
| DC IN | DC input (temperature, pressure, ...): |
| +DC | DC input positive pole, |
| -DC | DC input negative pole. |
| AC OUT | direct-current separated signal output from the connected vibration sensor: |
| AC OUT | AC signal, |
| AC GND | 0 V of the signal. |
| RS-485 | communication connection for the Adash 3600 system: |
| 485-A | signal A of RS-485, |
| 485-B | signal B of RS-485, |
| 485-AR | termination resistance 120R, for the termination of the interface to connect to terminal connector 485-B. |

| | |
|--------------------------|---|
| PROCESS | binary inputs: |
| +BIN1 | binary input No. 1, positive pole, supply max. DC 30 V / 4 mA, |
| +BIN2 | binary input No. 2, positive pole, supply max. DC 30 V / 4 mA, |
| -BIN12 | binary inputs No. 1 and 2, negative pole, |
| +BIN3 | binary input No. 3, positive pole, supply max. DC 30 V / 4 mA, |
| +BIN4 | binary input No. 4, positive pole, supply max. DC 30 V / 4 mA, |
| -BIN34 | binary inputs No. 3 and 4, negative pole. |
| RELAY OK | change-over contact of the OK relay: |
| NC | signal under the limit of alarms, |
| COM | common contact, |
| CN | complementary NC closed at rest. |
| RELAY ALERT | change-over contact of the ALERT relay: |
| NC | signal exceeded the ALERT limit, |
| COM | common contact, |
| CN | complementary NC closed at rest. |
| RELAY DANGER | change-over contact of the DANGER relay: |
| NC | signal exceeded the DANGER limit, |
| COM | common contact, |
| CN | complementary NC closed at rest. |
| RELAY SYSTEM | change-over contact of the SYSTEM relay: |
| NC | system functions, vibration sensor connected, |
| COM | common contact, |
| CN | complementary NC closed at rest. |
| LOOP1 'LF' | 4 – 20 mA output current loop of the measured value for the LF (ISO) signal: |
| +LOOP | loop positive pole, supply max. DC 30 V, |
| - LOOP | loop negative pole. |
| LOOP2 'B' | 4 – 20 mA output current loop of the measured value for the bearing condition signal: |
| +LOOP | loop positive pole, supply max. DC 30 V, |
| - LOOP | loop negative pole. |
| Power supply unit | separate power supply unit 24 V / 80 mA (per order only): |
| +24V | power supply unit positive pole, |
| 0V | 0 V of the power supply unit. |

Terminal Board of the Adash 3600-COM Module

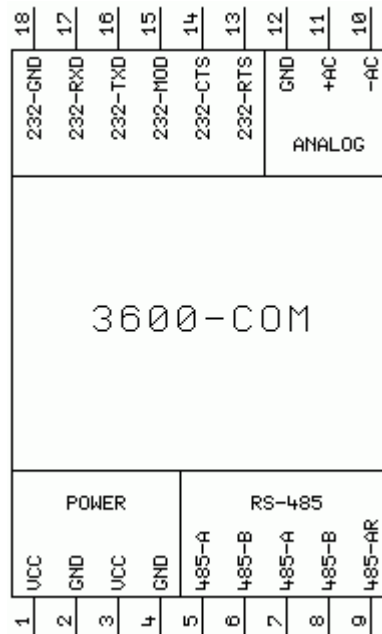


Fig. Terminal board of the Adash 3600-COM module

The display of the terminal board corresponds to the front view of the module.

Description of Terminal Connectors

POWER supply voltage (terminal connectors with the same marking are interconnected inside):

VCC +5 V / max. 50 mA,

GND 0 V.

RS-485 communication connection for the Adash 3600 system (terminal connectors with the same marking are interconnected inside):

485-A signal A of RS-485,

485-B signal B of RS-485,

485-AR termination resistance 120R, for the termination of the interface to connect to terminal connector 485-B.

ANALOG interconnection of the analogue output of the MAIN module with the BNC connector of the COM module:

-AC external contact of the BNC connector,

+AC internal contact of the BNC connector,

GND 0 V, non-used.

RS-232 signals for continuous communication on RS-232:

232-GND common potential (ground),

232-RXD data reception,

232-TXD data transmission,

232-MOD do not connect!,

232-CTS ready for reception,

232-RTS transmission released.

Terminal Board of the Adash 3600-PWR Module

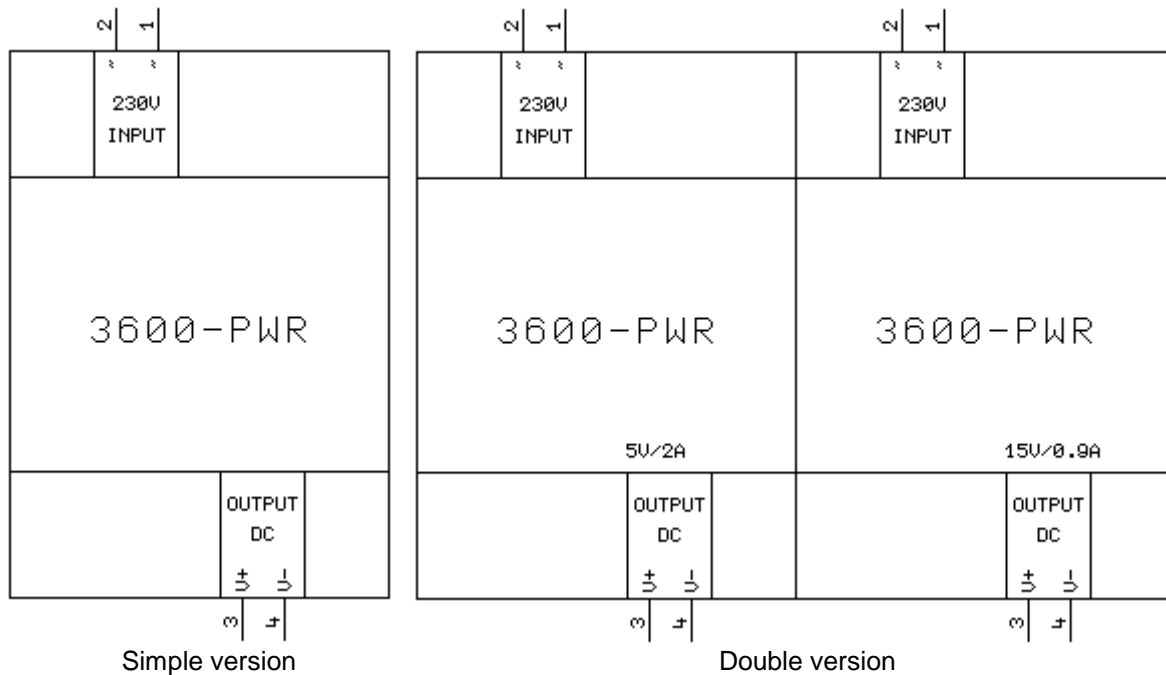


Fig. Terminal board of the Adash 3600-PWR module

The display of the terminal board corresponds to the front view of the module.

The voltage supply unit can have a combined version, with two separate supply units in one box: the right side of the module then serves to supply the current loops and binary inputs of the Adash 3600 system, having an output voltage of **15 V DC**.

Description of Terminal Connectors

INPUT mains voltage supply 110-230 V.

OUTPUT output of the DC stabilised voltage of 5 V / 2 A:
 V+ voltage supply unit positive pole,
 V- voltage supply unit negative pole.

Description of Adash 3600-MAIN

Adash 3600-MAIN is the main module of the Adash 3600 system. This module performs its own measurements and evaluation of vibration signals. It also controls other modules of the Adash 3600 system.

Vibration Sensor

The Adash 3600-MAIN module is equipped with **one** input for the connection of a **vibration sensor with ICP supply**. The used sensor must be an **accelerometer** (acceleration sensor). Its nominal sensitivity must be programmed during the unit configuration via the **Adash 3600 Setup** program. The sensor is connected to the **+ICP** and **-ICP** terminal connectors of the **Adash 3600-MAIN** unit.

If the single channel basic Adash 3600 set is extended with one or more Adash 3600-MPX modules to achieve a **multi-channel** set, then the nominal sensitivity must be programmed for each connected vibration sensor.

The sensors are connected to the **+ICP** and **-ICP** inputs of the **Adash 3600-MPX** module.

Signal Paths

The analogue signal from the vibration sensor (**accelerometer**) is conditioned prior to its conversion to the digital form:

- by filtration via an adequate frequency filter
- by integration or envelope modulator.

The method of the measured signal conditioning is determined by the selection of a suitable **signal path**.

The Adash 3600-MAIN module has four signal paths for vibration measurement:

| Signal path | Result unit | Frequency band | Signal conditioning |
|--------------------|--------------------|-----------------------|----------------------------|
| LF | [mm/s] | 10 – 1000 Hz | integration |
| HF | [g] | 5 - 16 kHz | none |
| LIN | [g] | 0.8 Hz – 16 kHz | none |
| ENV | [g] | 5 - 16 kHz | envelope modulator |

All parameters, incl. the signal path, are assigned to the measurement during the system configuration via the **Adash 3600 Setup** program.

Binary (process) inputs

Some machine works permanently without often changes of working conditions, but works of some machine is changed quite often. If machine works without changes, then the way of measuring of vibration is without changes too. But if working condition of the machine is often changed, then way of

measuring of vibration must be changed too. The A3600 system measure the machine even is OFF. To stop of the measuring on the turned-off machine is possible to use binary (process) inputs, which stops measuring only on the turned-off machine. On the working machines will be still measuring performed. Binary inputs are possible to use for dynamic data measuring (measuring of time or spectra) too. The dynamic data measuring considerably size of database. You can also use binary inputs for measuring of dynamic data.

Other case is a load change on a machine. The load change on the machine usually causes speed change and power change. If speed and power of machine is changed, then we want change the way of measuring of vibration too. For measuring change is possible to use binary inputs. The A3600 system contains 4 binary inputs, so we can set 4 different setups of measuring. If the machine works with greater load, then vibrations are greater too, but in this case greater vibrations don't mean a machine failure. If alarm limit doesn't change, then the system A3600 can detect false alarm. You can also use binary inputs to change of alarm limits.

The binary inputs of the Adash 3600-MAIN unit **serve to identify the measured machine state** (run up, coast down, ...). The module A3600MAIN set the pre-defined measuring base on the state of binary inputs.

Binary inputs are common terminals which are situated on the module A3600MAIN and which can be connecting to the power supply. If voltage from the process control system (PLC) is used as power supply, then process control system gets information about measured machine state to the A3600 system. A user control power supply can be used too. The binary inputs must be supply by DC voltage in the range of **4 – 30 V**, current **4 mA**.

If binary inputs are connected to the power supply and if are defined their functions, then A3600MAIN module tests voltage on the binary inputs (binary inputs are active or passive) and depend on the state of binary inputs set the pre-defined measuring.

Note. The A3600 system doesn't measure voltage on the binary input.

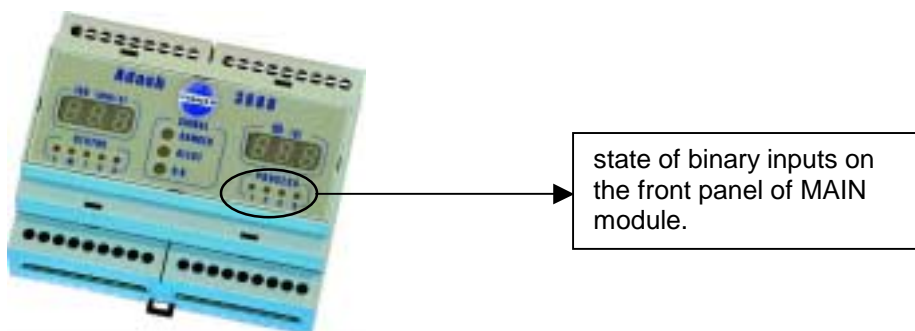
Binary inputs can be used for:

- setting of different alarm limits
- start of measuring
- start of dynamic data measuring

How simply start

Module A3600-MAIN makes possible to scan up to 4 binary inputs. State of binary inputs is indicated by LED on the front panel of A3600MAIN module.

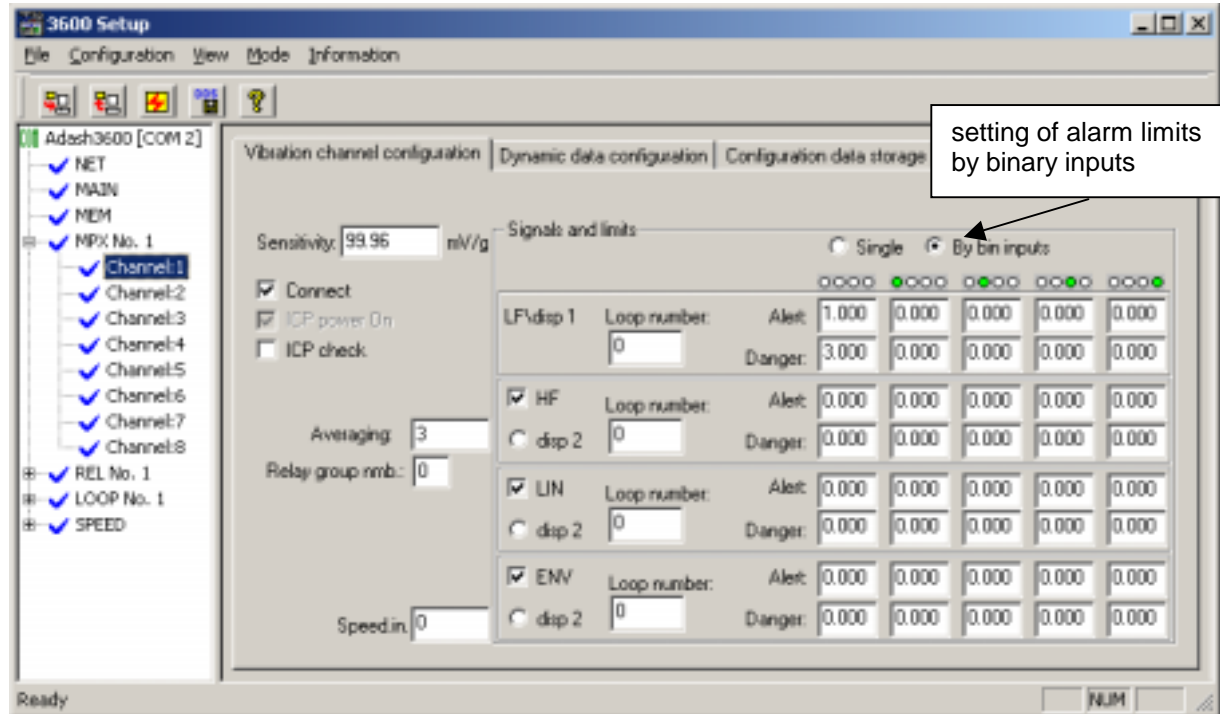
To set binary inputs use the A3600Setup application.



Attention!!! Terms "binary inputs" and " process inputs" are synonyms, which name the same terminal of the A3600MAIN module.

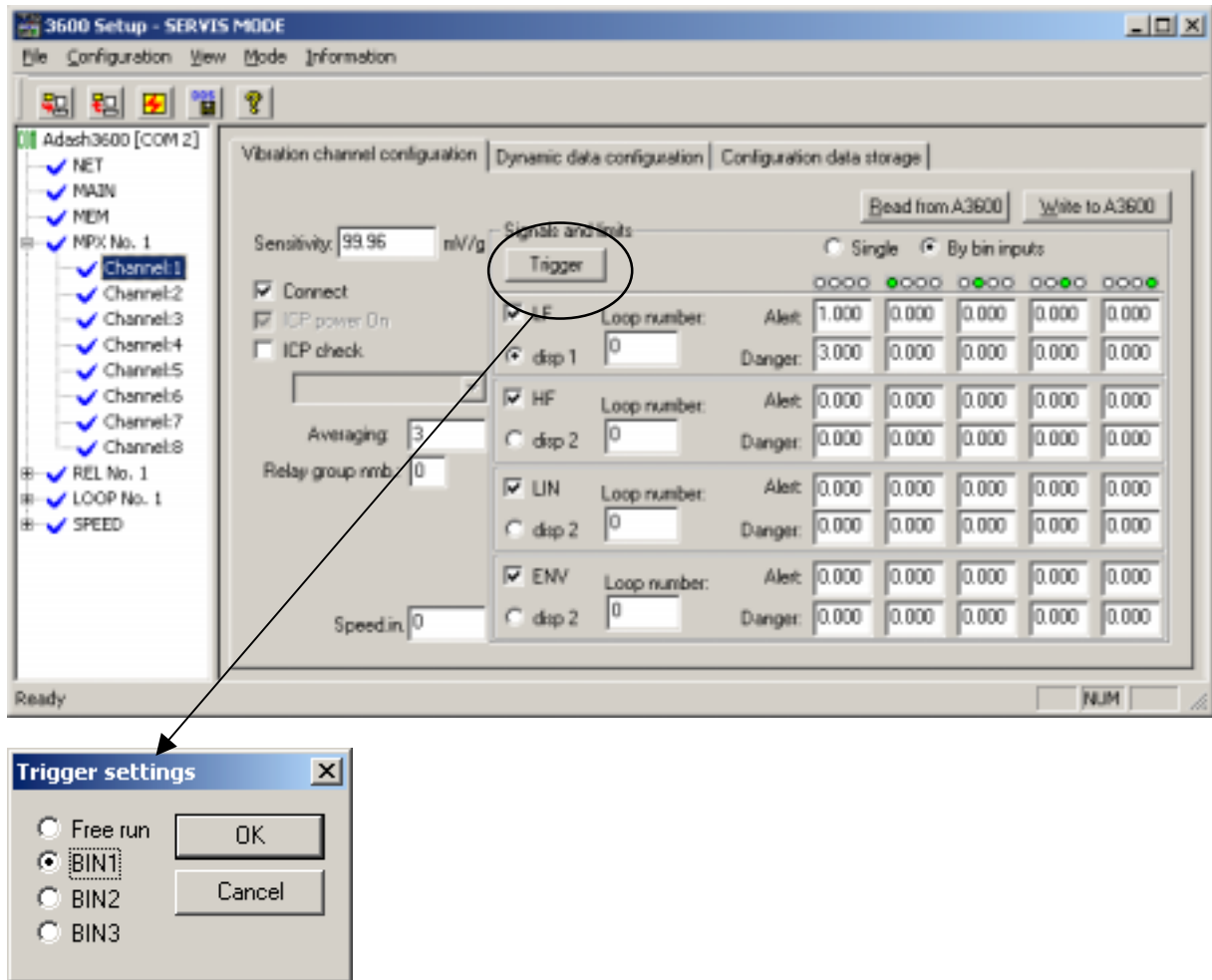
Setting of alarm by binary inputs

Choose radio-button **By bin inputs** in the **MPX - Channel window** and define group of alarm limits for used binary input. Alarm limits will depend on the active binary input. If more binary inputs are active, then leftmost active binary input has priority.



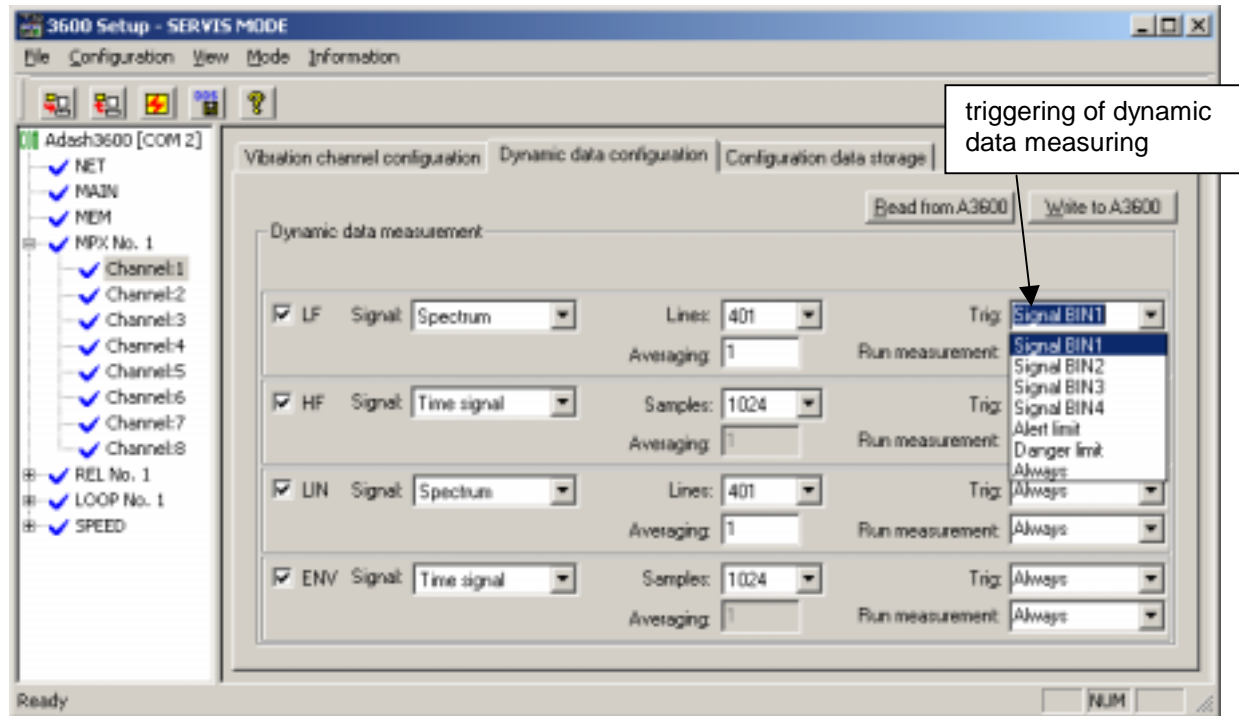
Measure triggering by binary inputs

Measuring on the input channel of the A3600 can be triggered by binary inputs (BIN1 - BIN3). This setting is available only in the **Service mode** (*Mode - Change mode - password: 456654*) of A3600Setup. Click on the button **Trigger** and select binary input, which will trigger a measuring. The measuring will start only if selected binary input is active. Binary input must be active all the measuring time. If this function is used, then blinks **T** control LED on the front panel of the A3600MAIN module.



Triggering of a dynamic data measuring by binary inputs

If you use this function, then dynamic data measuring depends on the binary input. Choose triggering binary input from the **trig** combo-box in the **MPX - Channel Dynamic data configuration window**. A dynamic data measuring will start only if selected binary input is active. Binary input needn't be active all the measuring time.



Hints for measurement triggering

1. If you want to trig all measuring types (static and dynamic) by one binary input, then static data trigger must be **BIN** and dynamic data trigger must be **Always**.

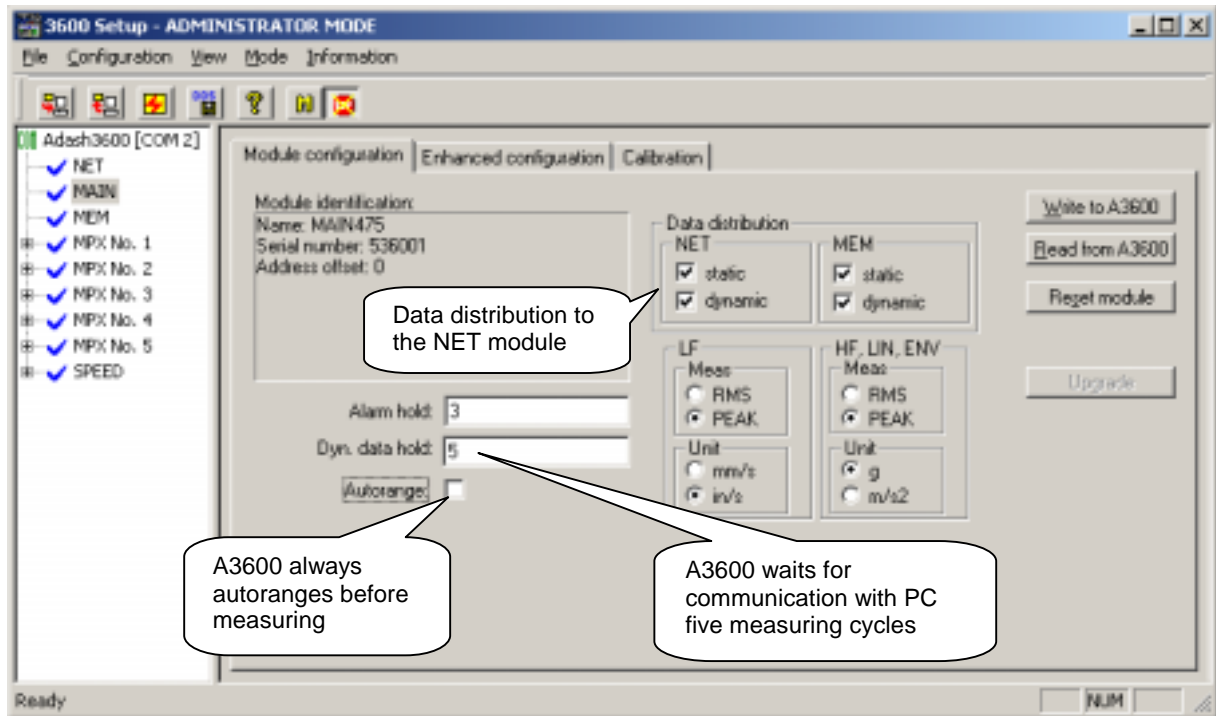
2. If you want to trig dynamic data only, then static data trigger must be **Free run** and dynamic data trigger must be **BIN**.

3. Reduction of speed of the measuring of the A3600 system can be caused by **Data Distribution** to the NET module and by **autorange**. A3600 waits for communication with PC some measuring cycles (5 in this case). If communication is done and dynamic data are saved to PC, then measuring continues. If communication fails, then data are stored to the memory module and measuring continues. If data distribution is not used, then you uncheck the checkbox - see picture below. Measuring ranges for all channels are stored in the MAIN module memory. If level of vibrations is relatively stable on all channels, then autorange is not needed to use. Using of the autorange is recommended only for measuring on the special machines, which generate unstable value of vibrations. Autorange is not needed for the measuring on the standard machine.

Note. If MAIN module is overloaded by sudden increasing of the vibrations, then autorange is used automatically.

4. How long must be the binary input active? It depends on the measuring settings. There are some examples of the time of measuring (all of the measurements are without autorange, averaging and data distribution to the NET module):

- LF RMS: 2 sec
- LF RMS + LF TIME: 6sec
- LF RMS + HF RMS: 3sec
- LF RMS + LF TIME + HF RMS + HF TIME: 11sec



Module Front Panel

On the front 3600-MAIN module panel all information is displayed on the state of the Adash 3600 system.

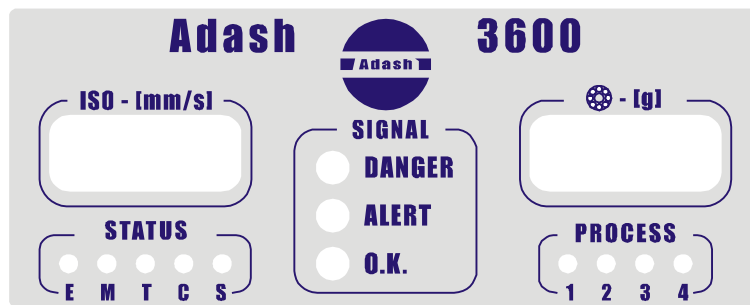



Fig. Front panel of the Adash 3600-MAIN module

Display of the Measured Signals

- ISO** vibration RMS value in 10 – 1000 Hz band at velocity [mm/s], signal path **LF**
-  RMS value of bearing condition vibration analysis at acceleration [g], assigned signal path **HF, LIN** or **ENV**.

Indication of the Output Relays Condition

The overload of the set alarm limits is signalled by the indicators situated in the **SIGNAL** box.

| Indicator | Signals |
|------------------|--|
| O.K. | no set limit has been exceeded (the OK relay closed) |
| ALERT | the ALERT limit exceeded, the ALERT relay closed |
| DANGER | the DANGER limit exceeded, the DANGER relay closed |

Indication of the BIN Input Signals Condition

The binary signals condition is indicated by the indicators in the **PROCESS** box.

| Indicator | Signals |
|------------------|--------------------|
| 1 | signal BIN1 active |
| 2 | signal BIN2 active |
| 3 | signal BIN3 active |
| 4 | signal BIN4 active |

Unit State Indication

The unit state is indicated by the indicators in the **STATUS** box.

| Indicator | Signals |
|--------------------|--|
| E - ERROR | unit error, the SYSTEM relay is open, detected error is displayed |
| M - MEASURE | the signal is being measured |
| T - TRIGGER | the unit is waiting for measurement trigger signal |
| C - COMM | communication of the unit with the connected system (data transmission between the modules of the set) |
| S - SETUP | the unit measurement parameters are being set up |

Interconnection of the Adash 3600 Set

In the basic version, the system is supplied as follows:

- Adash 3600-PWR .. power supply unit
- Adash 3600-MAIN .. main module
- Adash 3600-COM .. communication module (for system configuration via the Adash 3600 Setup program).



Fig. Modules of the set basic version

These modules are connected to the set according to the following schematic:

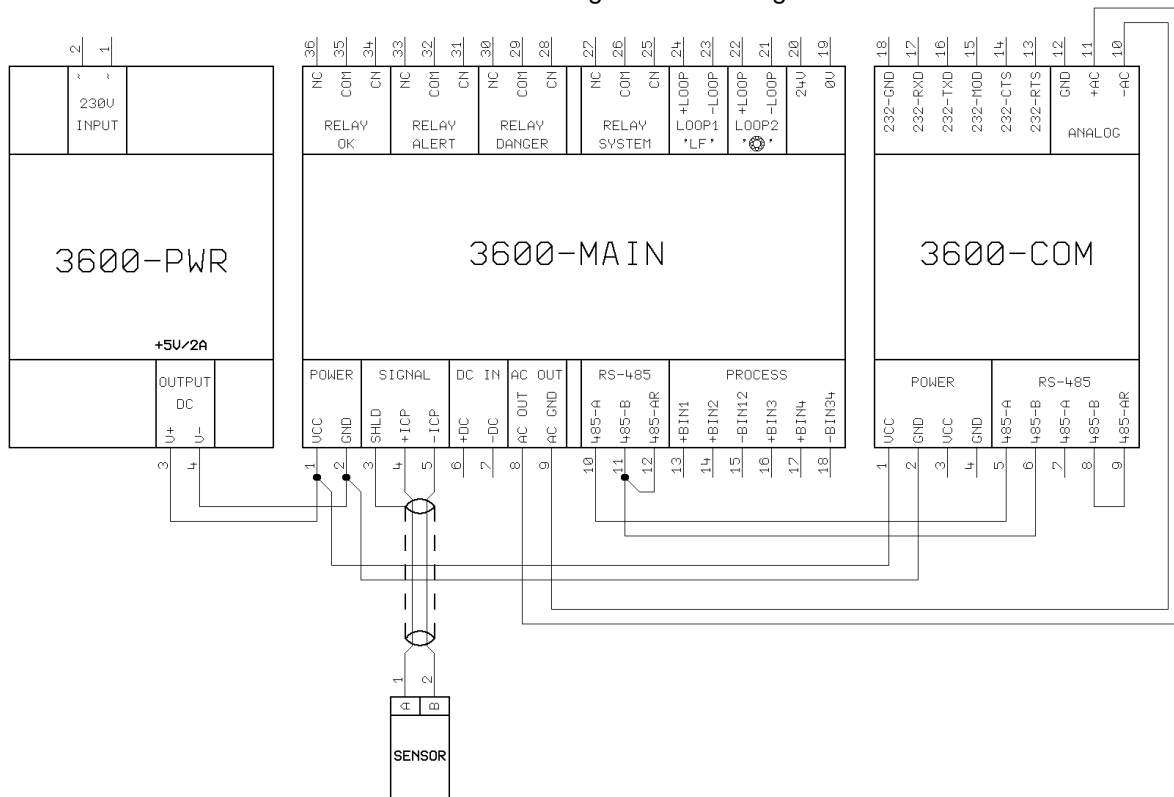


Fig. Schematic of connection of the basic Adash 3600 set modules

Recommended Procedure of Module Connection

1. Disassembly of terminal connector covers.

Remove the terminal connector covers of the modules by means of a suitable tool.



Fig. Removal of terminal connector covers

2. Interconnection of supply terminal connectors (VCC and GND).



Fig. Interconnection of modules supply conductors

The supply conductors are identified by the following colours in the supplied set:

- red conductor, positive pole of the supply (+5 V, VCC)
- blue conductor, negative pole of the supply (GND).

Pay attention to the correct polarity of the supply voltage! The positive voltage is always at the first terminal connector on the left.

3. Connection of communication terminal connectors (485-A, 485-B).



Fig. Interconnection of communication conductors

The communication conductors are identified by the following colours in the supplied set:

- white conductor, signal A of RS-485
- black conductor, signal B of RS-485.

4. Connection of interconnections (485-B, 485-AR).

At the last modules of the set, the terminal connectors of 485-B and 485-AR must be interconnected, such interconnection terminating the interface RS-485 with resistors 120R. The termination resistors of the interface are necessary to assure its higher resistance to interference.



Fig. Interconnection of terminal connectors with termination resistors on RS-485

5. Connection of the vibration sensor.

To connect the vibration sensor with ICP supply to the Adash 3600-MAIN unit, a special shielded twisted cable is supplied, which is marked and connected as follows:

| Conductor colour | Sensor terminal connector | Module terminal connector |
|----------------------|---------------------------|---------------------------|
| Shield (braiding) | - | SHLD |
| White | A | +ICP |
| White / blue (black) | B | - ICP |



Fig. Connection of the vibration sensor

6. Connection of mains power supply.

The terminal connectors for mains voltage supply for the entire set are located at the 3600-PWR module and are indicated L (phase conductor) and N (neutral working conductor).

Supply terminal connectors



Fig. Position of terminal connectors 230 V

7. Replace the terminal connector covers.

The interconnection of the basic Adash 3600 set modules is completed and the system is ready for configuration and measurement.

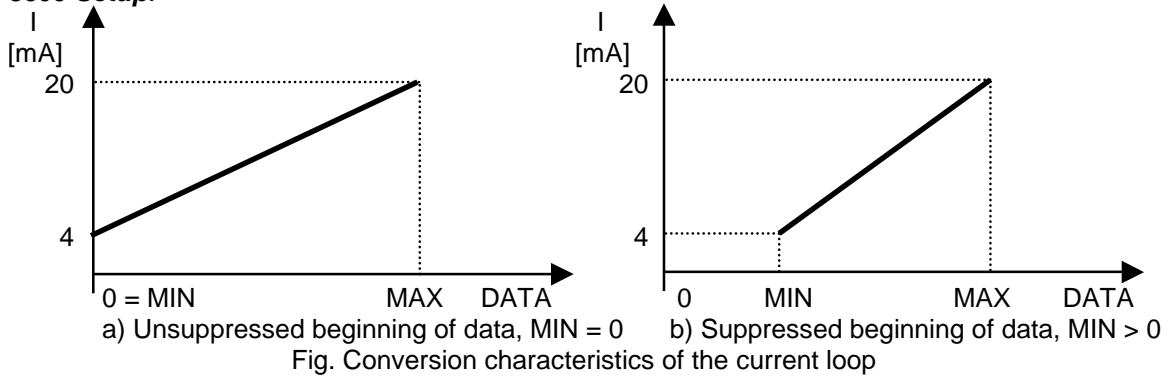
Connection of Other Devices

Current Loops 4 – 20 mA

The Adash 3600-MAIN unit has **two** current loops 4 – 20 mA for transmission / display of the measured data. **Loop1** is assigned to measurement ISO [mm/s] on signal path **LF**; **Loop2** is assigned to the selected measurement [g] via one of the remaining signal paths **HF**, **LIN**, **ENV**.

The assignment of the signal path to Loop2 is carried out via the **Adash 3600 Setup** program.

The output current loops of the Adash 3600-MAIN module are passive, therefore they must be supplied by an external DC voltage unit in the range of **8 – 30 V**. The range of the displayed MIN and MAX data, which correspond to the output current of loop 4 – 20 mA, can be programmed via **Adash 3600 Setup**.



Binary (Process) Inputs

The binary inputs of the Adash 3600-MAIN unit **serve to define the measured machine state** (run up, coast down, ...). According to the state of these inputs, various levels of alert and critical limits can be programmed for each measurement.

The binary inputs must be excited by DC voltage in the range of **4 – 30 V**, current **4 mA**.

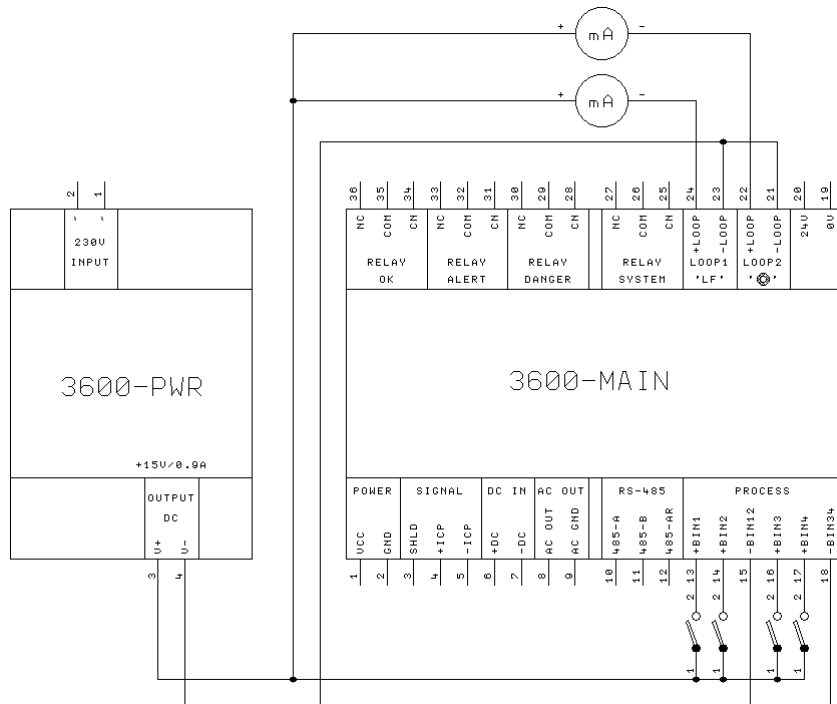


Fig. Connection of current loops and binary (process) inputs of the Adash 3600-MAIN module

Measurement by an External Analyser

1. To connect an external analyser to the Adash 3600 set, the **Adash 3600-COM** module is equipped with a BNC connector marked **SIGNAL**, to which the measured signal is fed from the vibration sensor. This signal is fed to the connector from the AC OUT and AC GND terminal connectors of the Adash 3600-MAIN module and is already free of the DC component of ICP supply.

NOTE: If you are NOT using a multiplexer unit
Before connecting the analyser to the **SIGNAL** connector of the Adash 3600-COM module, put a measurement terminal on its second connector marked **SERIAL**, which will assure the interruption of measurement at the Adash 3600-MAIN module and **the outlet of the measured signal with amplification 1** to connector **SIGNAL**.



Fig. Measurement terminal

2. If you connect the analyser directly to the **+ICP** and **-ICP** terminal connectors of the Adash 3600-MAIN module, you measure the signal from the vibration sensor directly without any conditioning, therefore including the DC component of ICP supply (approx. 12 V).

System Extension

The basic single channel Adash 3600 set can be extended to a multi-channel set by connecting the Adash 3600-MPX modules. The multi-channel sets can be further completed with other modules, which will assure the display, archiving and processing of the measured data.

Multi-channel Set

A multi-channel set can be created from the basic Adash 3600 set by extending it with **1 to 8 Adash 3600-MPX modules**. Up to **8 vibration sensors** can be connected to each multiplexer module, up to **four measurement types** can be requested at each sensor via 4 signal paths LF, HF, LIN and ENV. The configuration of the requested measurement types at individual vibration sensors is performed via the Adash 3600 Setup program.

Network On-line Data Transmission

If the Adash 3600 set is mounted with the **Adash 3600-NET network communication module** (it replaces the Adash 3600-COM module in the set), on-line transmission of the measured data to a host PC via LAN network is enabled.

For archiving and processing of the measured data the **DDS 2000** user software by Adash is required on the host PC. If also there is on-line measured data to be processed, the user software must be complemented with **DDS Data Manager**, which controls the data transfer from the A3600 to the PC.

Archiving of Measured Data

The Adash 3600 set can be extended with the **Adash 3600-MEM memory module**, which archives measured data on the flash card with a capacity of **16 MB to 128 MB**. The flash card with the measured data can be removed from the module at any time and the archived data can be imported to the **DDS 2000** user software by Adash for further processing.

For the systems with **on-line network transmission** of the measured data, all the on-line data are stored on the flash card that were not transmitted via network to the host PC and were overwritten with new data in the memory of the Adash 3600-NET module. In the set without the Adash 3600-MEM memory module the old on-line data would be lost. If the host PC is not continuously in operation but the user wants to archive all the on-line data, the Adash 3600 set must use the memory module.

Alarm Limits Signalling

The multi-channel Adash 3600 set can be extended with **1 to 8 Adash 3600-REL relay outputs modules** for the signalling of alarm limits overload of individual vibration sensors. Each Adash 3600-REL module is mounted with up to **eight relay pairs**. Each pair can be appropriately programmed so that it signals, by the close/open combination, three states: OK, ALERT and DANGER.

The assignment of a relay group to a sensor and the programming of the group behaviour for each of the three signalled states is carried out via the Adash 3600 Setup program.

Current Loops 4 - 20 mA

The basic Adash 3600 set has two current loops 4 – 20 mA for measured data output. By mounting **1 to 8 Adash 3600-LOOPS modules**, their number can be significantly increased. Each Adash 3600-LOOPS module has **8 or 16 programmable current loops 4 – 20 mA** for measured data output. In addition, each current loop of the Adash 3600-LOOPS module is able to display error conditions of measurement by output currents 3.5 mA, 3.75 mA, 22 mA and 24 mA.

The assignment of the current loop to the measurement, the setting of the measured data range for display by output current 4 – 20 mA and the assignment of output currents to error conditions is performed via the Adash 3600 Setup program.

Operation of the Adash 3600-MAIN Module

If the unit is in operation, it displays continuously measurement results and, based on the results, updates the output current of current loops 4 – 20 mA in accordance with their set measurement range. At the same time, status indicators **M** (measurement), **S** (measurement parameters setting) and **C** (communication between the modules of the set) flash.

Also the measured signal values are checked continuously for the set alarm limits overload and, based on the evaluation, the relative relays switch. If no alarm limit is exceeded, the **OK** relay is active. If any alarm limit is exceeded, the **OK** relay opens and the relay that signals the state of the relative exceeded limit becomes active.

If no error is detected, the **SYSTEM** relay closes. If communication failure, sensor supply failure etc. occur, indicator **E** switches on and the type of error appears on the display. Simultaneously, the **SYSTEM** relay opens.

Errors Displayed by the Adash 3600-MAIN Module

| | |
|---------|--|
| ERR ICP | - sensor supply error, sensor disconnected or short-circuited, measurement impossible. |
| ERR OVR | - sensor overexcited, vibration value exceeded the measurement range, measurement impossible. |
| ERR NET | - data buffer memory for network communication is full, current values cannot be stored. |
| ERR MEM | - no response from the Adash 3600-MEM module, usually the flash card is removed. |
| ERR STO | - data storage error, usually the STOP delay of the Adash 3600-MEM module is counting down. |
| ERR xx | - error of communication with module No. xx (each module has its No. xx on the system interface) |

List of Module Numbers on Interface RS-485

In case of error, the module number appears on the Adash 3600-MAIN display in the HEX form.

| Module number | Module type |
|----------------------|---|
| 11H to 1BH | Adash 3600-REL, module 1 to 12 respectively |
| 21H to 2BH | Adash 3600-MPX, module 1 to 12 respectively |
| 31H to 3FH | Adash 3600-LOOPS, module 1 to 15 respectively |
| 51H | Adash 3600-COM, COMD or NET |
| 53H | Adash 3600-GSM |
| 55H | Adash 3600-MAIN |
| 57H | Adash 3600-MEM |

Examples of Use

Use of Binary Inputs

According to the state of four binary inputs of the Adash 3600-MAIN unit, up to 5 alarms can be set up, for instance by assigning as follows:

| <i>Binary inputs status</i> | <i>Alarm</i> | <i>Limit</i> | <i>Measured machine status</i> |
|------------------------------------|---------------------|---------------------|---------------------------------------|
| active BIN1 | ALARM 1: | 15 mm/s | run-up |
| active BIN2 | ALARM 2: | 10 mm/s | operating condition |
| active BIN3 | ALARM 3: | 15 mm/s | coast down |
| active BIN4 | ALARM 4: | 12 mm/s | increased power |
| No input active | ALARM 0: | 0 mm/s | machine does not run |

Note.

The 0 mm/s value corresponds to the state "ALARM OFF".

If two binary inputs are activated simultaneously, the input with higher ordinal number has higher priority (the BIN2 input precedes the BIN1 input etc.).

Technical Specification of Adash 3600-MAIN

- Inputs:**
- 1 for vibration measurement (accelerometer with ICP supply)
 - 4 binary for definition of machine state (run, coast down, run up, ...) and for external trigger
 - 1 DC for DC value of operational quantity (power, machine speed, temperature,...)
- Outputs:**
- 1 analogue AC buffered signal from the vibration sensor (output short-circuiting will not effect the signal measured by the unit)
 - 4 relays with change-over contacts (~250 V / 0.4 A, 100 W):
 - OK unit
 - OK state (no critical value exceeded)
 - Alert limit exceeded
 - Danger limit exceeded
 - 2 current loops 4 – 20 mA, galvanically separated:
 - vibration power by ISO 2372 via signal path LF
 - bearings condition measured via the selected signal path HF, LIN, ENV
- Data processing:**
- vibration power measurement by ISO 2372 - LF (mm/s in 10 – 1000 Hz band)
 - bearings condition measurement
 - HF (g in 5 – 16 kHz band)
 - LIN (g in 0.8 Hz – 16 kHz band)
 - ENV (g envelope analysis - HFE in 5 – 16 kHz band)
 - time signal and signal spectrum via LF, HF, LIN and ENV signal paths
- Signal conditioning:**
- integration
 - envelope modulation in 5 – 16 kHz band
- Sampling frequency:**
- 4 kHz for vibration power measurement by ISO 2372
 - 40 kHz for bearing condition measurement
- Limits:**
- Alert and Danger
- (The limits are set up for each measured quantity separately: various limit values can be set up for various machine operating states defined by binary channels. Various limit levels can be set up according to the operational quantity value defined by the level of DC input.)
- Trigger:**
- auto (free run)
 - external trigger
- Measurement interval:** - approx. 750 ms (for measurements of static values only)
- Interface:**
- serial RS-485 for communication between the modules of the set
 - serial RS-232 via the Adash 3600-COM module
- Protection:**
- IP20
- Temperature range:**
- -10 °C to +50 °C
- Supply:**
- 5 V / 0.5 A DC
- Dimensions:**
- 106 x 90 x 58 mm
- Weight:**
- 275 g
- Mounting:**
- DIN rail
- Unit setting:**
- using the Adash 3600 Setup program from PC via serial interface RS-232

Technical Specification of Adash 3600-COM

- Inputs:** - 1 analogue, vibration sensor AC signal from the 3600-MAIN unit
- Outputs:** - 1 analogue buffered signal from vibration sensor (output short-circuiting will not effect the signal measured by the unit) at the BNC SIGNAL connector
- Interface:** - serial RS-485 for communication between the modules of the set
- serial RS-232 for communication with the superior PC via the SERIAL connector
- Transmission parameters:**
- 8 bits of data
 - without parity
 - 1 stop bit
 - version COM (basic) 2400 Bd or 4800 Bd
 - version COMD (on-line RS-232) 4800 Bd or 9600 Bd
 - version NET (on-line RS-232 / LAN) from 600 Bd to 57600 Bd
- Protection:** - IP20
- Temperature range:** - -10 °C to +50 °C
- Supply:** - 5 V / 50 mA DC
- Dimensions:** - 53 x 90 x 58 mm
- Weight:** - 140 g
- Mounting:** - DIN rail
- Unit setting:** - using the Adash 3600 Setup program from PC via serial interface RS-232

Technical Specification of Adash 3600-PWR

| | |
|---------------------------|---|
| Input voltage: | - 110~230 V 50-60Hz |
| Output voltage: | - 5 V / 2 A for simple version - 5 V / 2 A + 15 V / 0,9 A for double version |
| Protection: | - IP20 |
| Temperature range: | - -10 °C to +50 °C |
| Supply: | - ~230 V |
| Dimensions: | - 53 x 90 x 58 mm for simple version - 106 x 90 x 58 mm for double version |
| Weight: | - 130 g for simple version - 255 g for double version |
| Mounting: | - DIN rail |

Dimensioned Sketch of Adash 3600-MAIN, 3600-COM and 3600-PWR

