



## User's guide



# Memory Module using FAT16 Adash 3600-MEM V3.2X

### Application:

- ☞ Measured data storage of the Adash 3600 on-line monitoring system
- ☞ Data are stored on Compact Flash Card
- ☞ Measured data archive module for off-line systems
- ☞ Backup medium of on-line systems in the case of an on-line data transferring interrupt

### Characteristics:

- ☞ Data are stored in daily data files year-month-day.mem (20050131.mem)
- ☞ Export of stored data to a database using the Adash DDS 2000 expert system
- ☞ Compact flash card (size up to 4GB) requires only standard FAT16 formatting
- ☞ Internal Format Disk available
- ☞ Supports Compact Flash cards with faster transfer rates, ATA-4 spec. (Ver. 3.22)



Ref: 20102005 WR

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## Terminal Board of the Adash 3600-MEM Module

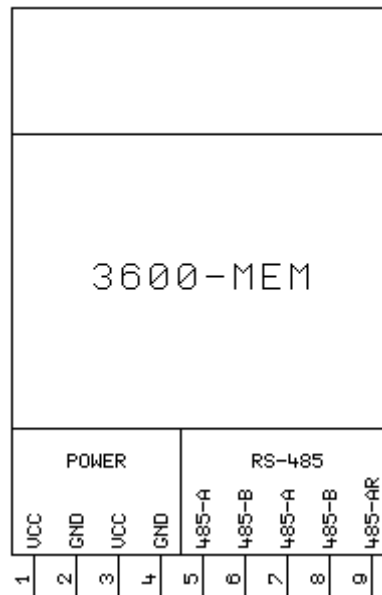


Fig. Terminal board of the Adash 3600-MEM module

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 / 250 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, connect to terminal connector 485-B. Should be connected at the first and the last module of the RS485 chain.

## **Description of Adash 3600-MEM**

The Adash 3600-MEM module is used for measured data storage. Data storage can be enabled/disabled and a stored data parameters can set using A3600 Setup software. **The module is able to archive data using a Compact Flash Card with capacity up to 4GB, formatted in FAT16.** The flash card can be removed from the module any time after the button is pressed and 'Stp' appeared. Stored data can be imported to the database of the *DDS 2000* user software, using common Compact Flash Card reader.

After card is inserted into the module, A3600 folder is made. If data storage is allowed (in A3600Setup software), measured data are stored into the folder in daily data files year-month-day.mem. Date is set by date of RTC (real time clock), eg. 2004 January 31 – 20040131.mem. Data files are normally made until card is totally full (100%). Then the oldest file A3600 is deleted ("dEL" displayed) and makes place for next data storage, however we lose a part of archived data. **Therefore is recommended, to copy archived data files before card is full and always to use an empty Compact Flash Card .** When a file is deleted display flashes and A3600Setup displays in MEM window "Card is totally full".

Any data can be stored on Compact Flash Card except for two restrictions. First , Root directory cannot contain an entry with name A3600. Second, A3600 folder cannot contain an entry with a name 20XXXXXX.mem, where X is any character.

**In spite of fact that beside of A3600 files, any data can be stored on the Compact Flash Card, is recommended to copy data and delete card before the use.**

### **Date & Time setting**

Memory module uses its own RTC (Real Time Clock circuit), which can be set from PC using A3600Setup software. Each file name is set by RTC date. For that reason, **always check RTC date & time before card is inserted into the module and always check if the date & time is set correctly, using A3600 Setup software (Read Configuration from A3600 system). Wrong RTC date & time will cause that file date will not correspond to correct date &time.**

When flash card is not inserted into the module, date & time can be changed without limits. If card is inserted, date can be changed forwards only. When RTC date is older than an A3600 file date on the card, flashing 'rtc' is displayed. In this case remove the card , copy data, delete or format card, set, write and check correct date & time into the A3600 system. Then you can put flash card back into the module.

**When flashing 'rtc' is displayed (RTC date is older than a file date) and A3600 system is reset or turned off/on, RTC date will be set by the newest A3600 file date contained on the flash card. This date may not correspond to correct date.** This feature keeps data storage into daily files when RTC backup battery is failed.

**When data are not stored and all dots are displayed, RTC date is not correct ' -.-.-. ' (RTC is failed, module has not been inicialized or RTC date was set by the newest A3600 file date ).** Remove the card, copy data, delete/format card. Using A3600 setup software, set, write and check correct RTC date&time. **After RTC date is writen into A3600 system, the displayed dots should disappear ' - - - ' .**

## Archived data

Two types of data can be stored on the flash card simultaneously:

- 1) Just measured data that the main 3600-MAIN system unit sends for archiving.
- 2) Previous on-line data that have not been submitted by the 3600-NET or 3600-COMD module for further processing yet but that would be overwritten with the new measurement data from the 3600-MAIN unit.

After import, both the types of data can be mutually distinguished in the DDS database.

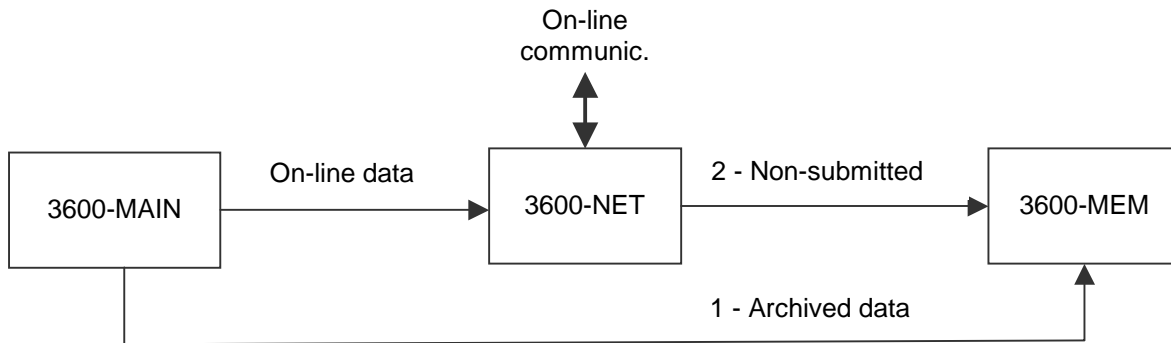


Fig. Two types of stored data

The evaluation whether the just measured data are archived at the flash card of the 3600-MEM module is performed by the main Adash 3600-MAIN system unit. **Description of requirement selection and method of data archiving - see Adash 3600 Setup, User's manual.**

The non-submitted on-line data are archived whenever the main 3600-MAIN unit, upon its start, found the 3600-MEM memory module and the module of on-line communication 3600-NET or 3600-COMD.

## Display of Module Status

The 3600-MEM module is equipped with three-digit seven-segment display, which presents from time to time the module state.

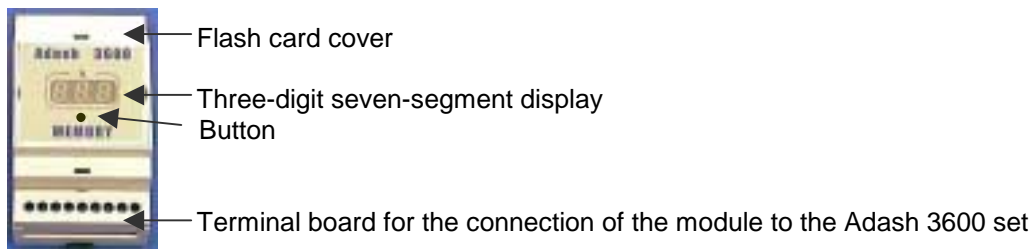


Fig. Module 3600-MEM

Displayed	Modulu status
---	card is not inserted
3.20	software version, displayed after card is inserted or when button is pressed and card is not inserted,
FAt, FILE	card is being initialized,
XXX	XXX is nuber 0..100, used space [%], flashing display indicates that at least one file has already been deleted ( card was full ),

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**Displayed Modulu status**


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<b>StP</b>	(STOP) card is deactivated. Displayed after the button is pressed or after format disk has been successfully completed. We can take the card out in 10s. After that the card is activated again, data record can continue,
<b>F - -</b>	(card is not inserted) format disk activated, displayed when button is pressed for approximately 4s, then release the button and insert the card in 10s, otherwise format disk is deactivated,
<b>F00-99</b>	card is being formatted,
<b>8 . 8 . 8 .</b>	when all dots are displayed, not correct RTC date is set, flashing dots indicates data storage,
<b>bAd</b>	bad data sector occurred,
<b>dEL</b>	when card is full, the oldest file A3600 is being deleted,

**Warnings** (flashing display)

<b>FUL</b>	not minimum required space on the card (A3600 size + free space < 1% of card size) or root directory is full (max.512 entries),
<b>rtc</b>	RTC date is older than an A3600 file date on the card,

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**Errors** (flashing display)

<b>E01</b>	not FAT16 system or bad partition table parameters,
<b>E02</b>	bad BIOS parameter block,
<b>E03 - E05,E14,E15</b>	FAT system failed,
<b>E06,E24 - E29</b>	FAT system failed,
<b>E10</b>	root directory contains an entry with name A3600, but it is not directory,
<b>E11,E12</b>	initialization failed – bad IDE parameters, card not properly inserted ,
<b>E13</b>	EEPROM failed, hardware error,
<b>E20</b>	delete operation failed,
<b>E30 - E59</b>	reading error,
<b>E60 - E79</b>	writing error,
<b>E80 - E99</b>	an attempt on unauthorised writing to a protected system sector,
<b>Err</b>	(card not inserted) hardware error,

**Format Errors** (flashing display)

<b>EF1</b>	IDE parameters failed ,
<b>EF2</b>	card size > 4GB,
<b>EF3</b>	writing error,
<b>EF4 – EF8</b>	reading error,

When an error appears, take out the card, copy data, format the card (**do not use quick format !**) or use a new card, reset A3600 system and insert the card again. If not successful, contact your vendor.

## Manipulation with the Flash Card

**Compact Flash card must be formatted in standard FAT16 system before the use !**

After data are imported into the DDS database, the flash card should be deleted or formatted in standard FAT16 system.

More information about data import - see **DDS 2000, User's manual, section Adash 3600 Monitoring System.**

## Chosing Compact flash card size

A3600 memory module allows to store data on a Compact Flash Card with size up to 4GB. However some older operation systems cannot work with 4GB card using only one partition, formatted in FAT16.

Minimum required space is 1% of card size and is given as sum of A3600 size (of all A3600 files 20XXXXXX.mem ) and free space on the card. If the condition is not met, card is not accepted ('FUL' displayed).

### **Important note !**

**If you want to keep all measured data on the card, required space on the card must be always larger than the expected amount of data that will be stored on the card or you have to ensure that card will be taken out before is full.** Otherwise if card is full, the oldest file is deleted. The worst case is when card is full and only one A3600 file exists. It means that no data record is available when file is deleted and new created file does not contain a data record yet.

Maximum amount of data (dynamic data storage) is approximately 50MB per day. In the case of continuous static data storage it is about 3MB per day.

## Compact Flash card formatting

Card can be formatted on PC or directly in memory module using internal format disk.

- take the card out from the module, if inserted ( ' - - - ' displayed),
- press the button and keep it pressed (for 4 to 5 second) until " **F - -** " is displayed (format disk activated), then release the button,
- insert the card in 10s, otherwise format disk is deactivated,
- when card is being formatted, "**F00**" to "**F99**" is displayed,
- after card is successfully formatted "**StP**" (flashing) is displayed, card can be taken out in 10s or left in module, after 10s is initialized and ready for data storage,
- if an error occurred during formatting, **EF1** to **EF8** is displayed,

Formatting can take few minutes, it depends on card size.

## Flash Card Exchange

The flash card is inserted in the 3600-MEM module in the connector and covered. When exchanging the flash card the Adash 3600 system **does not have to be** disconnected from supply. Proceed as follows:

- 1) Release and remove the flash card cover using a suitable tool. Press the button and hold on until the StP message appears on the display. Then release the button.
- 2) By simple pulling, take out the card ; the display will display - - - or -.-.-.
- 3) Insert an empty flash card, formatted in FAT16. The display will show the following messages: 3.10 (SW version), FAT, File (initialization) and 0 ([%] used space, 0 -> card is empty)
- 4) Put on and close the module cover.

If all the three dots are displayed, do not forget to set the correct date and time into the 3600-MEM module using **Adash 3600 Setup** software.



Fig. Removal of the flash card cover



Fig. View of the inserted flash card



Fig. Removal of the flash card



Fig. Card completely released

## **Function of the Button on the Front Panel of the Module**

- **Card inserted, a longer press** deactivates the inserted card, the StP (STOP) message appears on the display and you have 10 seconds **to remove it** from the module. If the card is not removed from the module during this period, it is activated again and data storage can continue,
- **Card not inserted, a short press** software version 3.20 is displayed,
- **Card not inserted, a longer press (4 to 5 seconds )** format disk is activated.

Prior to **removing** the flash card from the module, **hold the button pressed until the StP message appears on the display**, which signals the card is deactivated. **Then release the button and remove the card from the module within 10 seconds.**

# Extending the A3600 system with the Adash 3600-MEM Module

The connection of the Adash 3600-MEM module to the Adash 3600 set is done according to the following schematic:

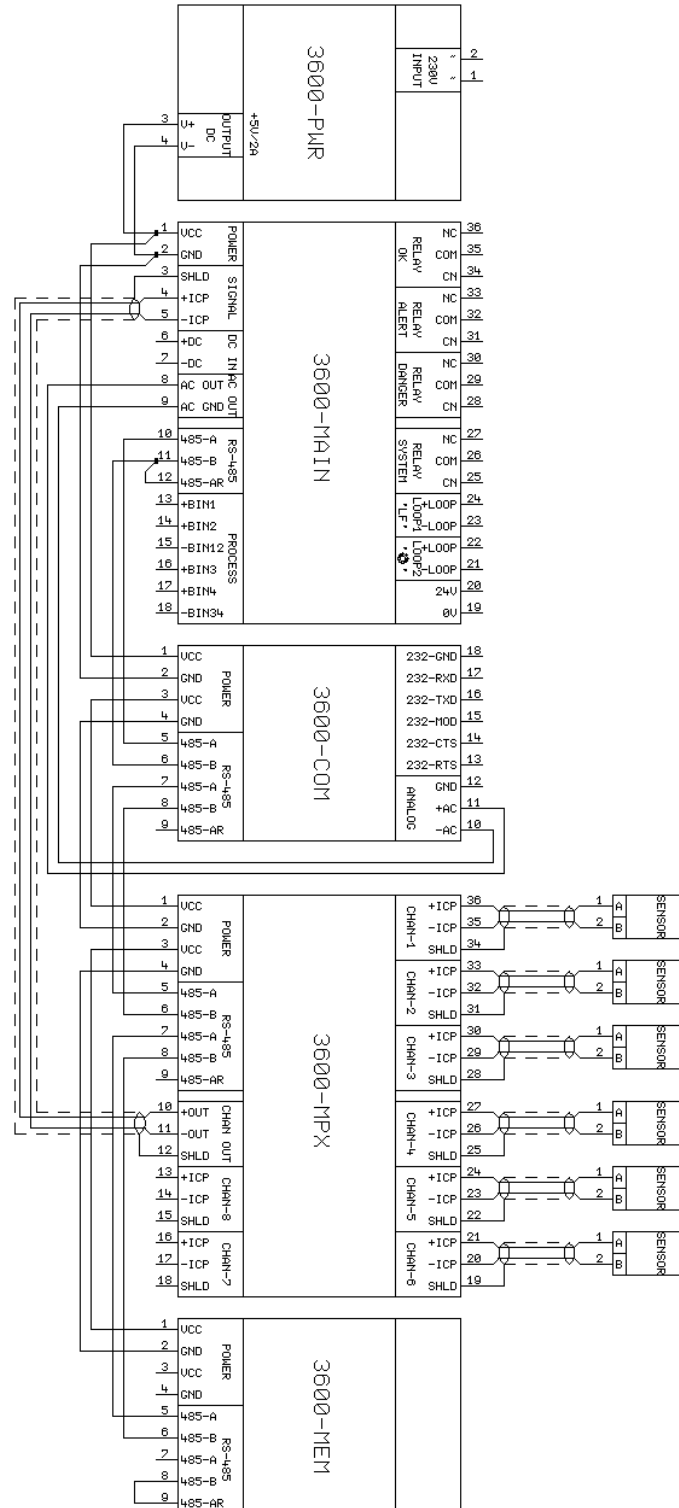


Fig. Schematic of connection of the 3600-MPX and 3600-MEM modules to the Adash 3600 system

## Recommended Procedure of Module Connection

1. Remove terminal connector covers.



2.

Fig. Removal of the terminal connector covers

2. Disconnect power supply and RS485 wires.



remove  
interconnection

Fig. Interconnection at the end module 3600-MPX

At the set end module (in this case 3600-MPX) there is a resistance termination of RS-485 via an interconnection of terminal connectors 485-B and 485-AR. This interconnection must be removed and installed at the end module of the extended set (in this case 3600-MEM).

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

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.**



Fig. Interconnection of supply conductors

4. Connection of communication terminal connectors (485-A, 485-B) and interconnection (485-B, 485-AR) of the 3600-MEM module.



Fig. Interconnection of communication conductors

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

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

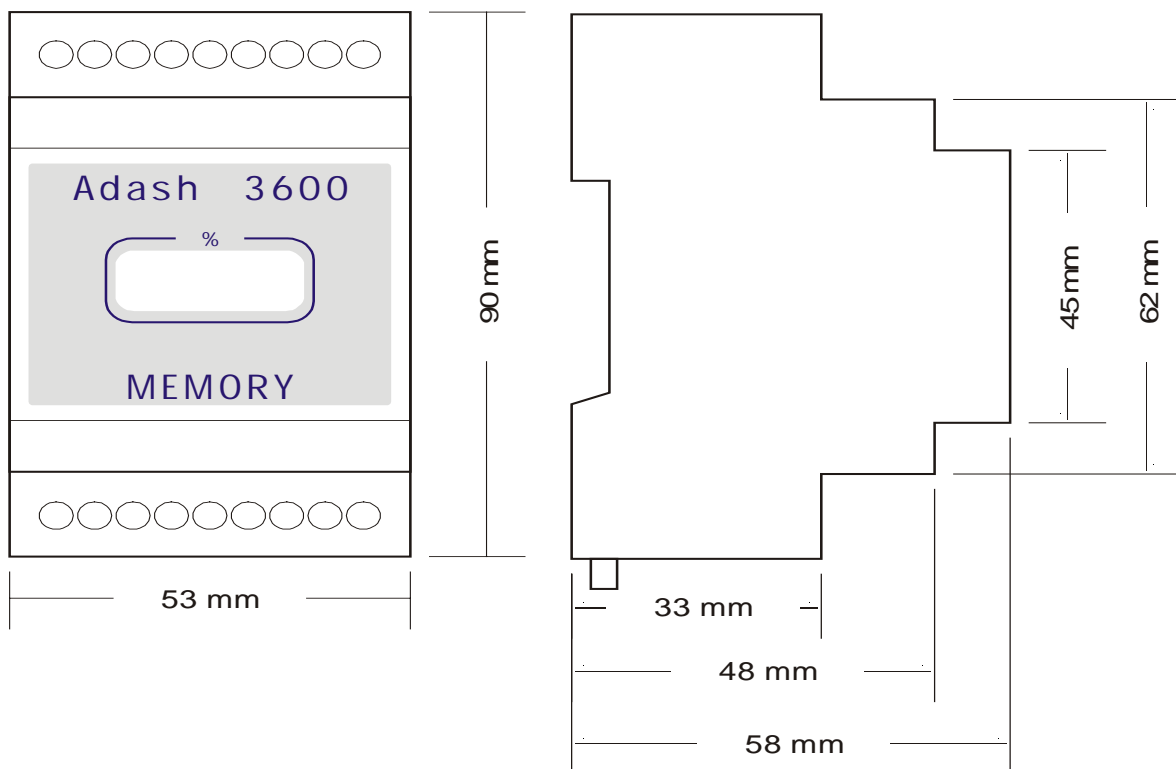
5. Replace the terminal connector covers.

The extension of the Adash 3600 set with the 3600-MEM module is completed and the system is ready for measurement.

## **Technical Specification of Adash 3600-MEM**

<b>Memory medium:</b>	- flash card with capacity up to 4 GB
<b>Display:</b>	- three-digit seven-segment display
<b>Interface:</b>	- RS-485 for the communication between the Adash 3600 modules
<b>Control:</b>	- by the main Adash 3600-MAIN unit
<b>Unit setting:</b>	- using the 3600 Setup program using communication unit Adash 3600-COM, Adash 3600-COMD or Adash 3600-NET
<b>Protection:</b>	- IP20
<b>Temperature range:</b>	- -10 °C to +50 °C
<b>Supply:</b>	- +5 V / 250 mA
<b>Dimensions:</b>	- 53 x 90 x 58 mm
<b>Weight:</b>	- 150 g
<b>Installation:</b>	- DIN rail

### ***Dimensioned Sketch of Adash 3600-MEM***



## **The differences between versions**

<b>Version 210,</b>	after card is inserted, module displays CON,CX and flash card used space.
<b>Version 3.10, 3.20</b>	after card is inserted, module displays 3.10 (3.20), FAt, FiE and flash card used space , if card is not inserted and the button is pressed, version is displayed.