

# AIDA2020 Kick-Off Meeting

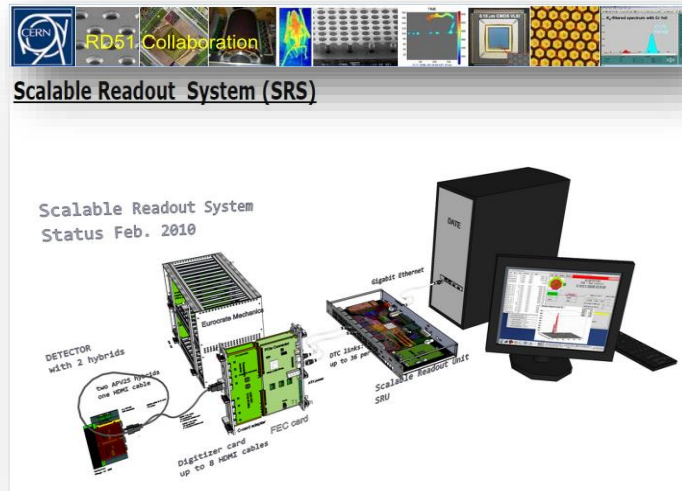
WP13 Task 13.3.1

## WP13 Task 13.3.1

interfacing FE-chips specific to gas detectors to  
the Scalable Read-out System (SRS)

[Tools to facilitate the detector development]

# Scientific and technological aspects



- Easy-to-use
- Portable
- Scalability from small to large system
- Common interface for replacing the chip frontend
- Integration of proven and commercial solutions
- Availability of robust Data Acquisition software package

Support from **AIDA2020**

- High impact in the community:

- More than 2000 APV25 chips in use with SRS in the mpgd /rd51 community
- SRS Components for R&D on detectors with APV25 FE chip available on the CERN store

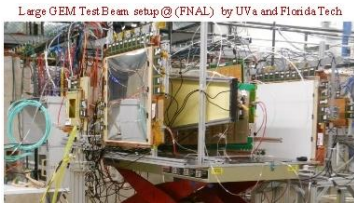


07.89.00 - RD51 SRS PROJECT

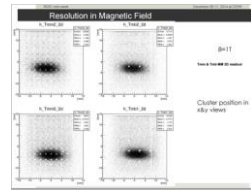
# Scientific and technological aspects

Common interface for replacing the chip frontend: Status

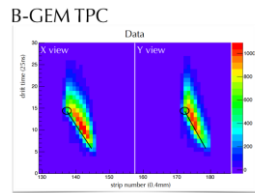
## SRS & APV25 – Large MPGD/RD51 community



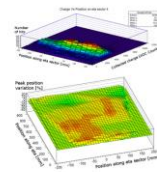
Uva & Florida Tech



ATLAS NSW mm test beam



ESS and CERN GDD

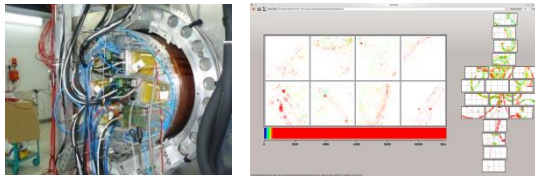


CMS-GEM

New FE ASIC with:

- Charge & time information
- Self triggering
- High readout rate

## SRS & Timepix (LC-TPC) – Bonn/Desy



Interfacing TimePix3

## SRS & SiPM (NEXT TPC)



Support from

**AIDA2020**

# Scientific and technological aspects

New FE ASIC with: Charge & time information, self triggering, high readout rate

Selected FE ASICs:

CERN (H. Muller, E. Oliveri)

- VMM (under development)
  - Front End Chip under development for ATLAS New Small Wheels Upgrade
  - Future baseline solution for the RD51 SRS community
  - Interest by the European Spallation Source (ESS) and ALICE FOCAL communities

AGH Krakow (B. Mindur) and CERN (E. Oliveri)

- GEMROC (existing)
  - Optimized for MPGD detectors
  - Designed for high count rate applications (Proton Range Radiography, X-Ray Imaging,..)

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Support from **AIDA2020**

- Design and production of VMM-128 hybrid and DCARD (hybrid/FEC adapter)
- SRS-ATCA Optical-Copper link.
- Adapter (Receiver) card for integration of SRS-ATCA Optical-Copper link to SRS-Classic.
- System integration and testing

# Scientific and technological aspects

New FE ASIC with: Charge & time information, self triggering, high readout rate

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Support from **AIDA2020**

- Define hybrid and SRS cards specification.
- Layout of the new hybrid / SRS Cards.
- Production of and testing of the new cards/demonstrator.

# Scientific and technological aspects

University of Bonn (K. Desch, J.Kaminski )

TimePix3+InGrid: ultra fast and precise detectors with wide range of applications.

## Requirements:

- Easy-to-use readout system
- Based on NIKHEF (SPIDR) and Bonn (SRS TimePix readout)

## System:

Support from **AIDA2020**

- Standard SRS(FEC) and SRU for larger system
- New Interface Card to be developed
- FPGA firmware development (based on NIKHEF-SPIDR but to be implemented)

## Aims:

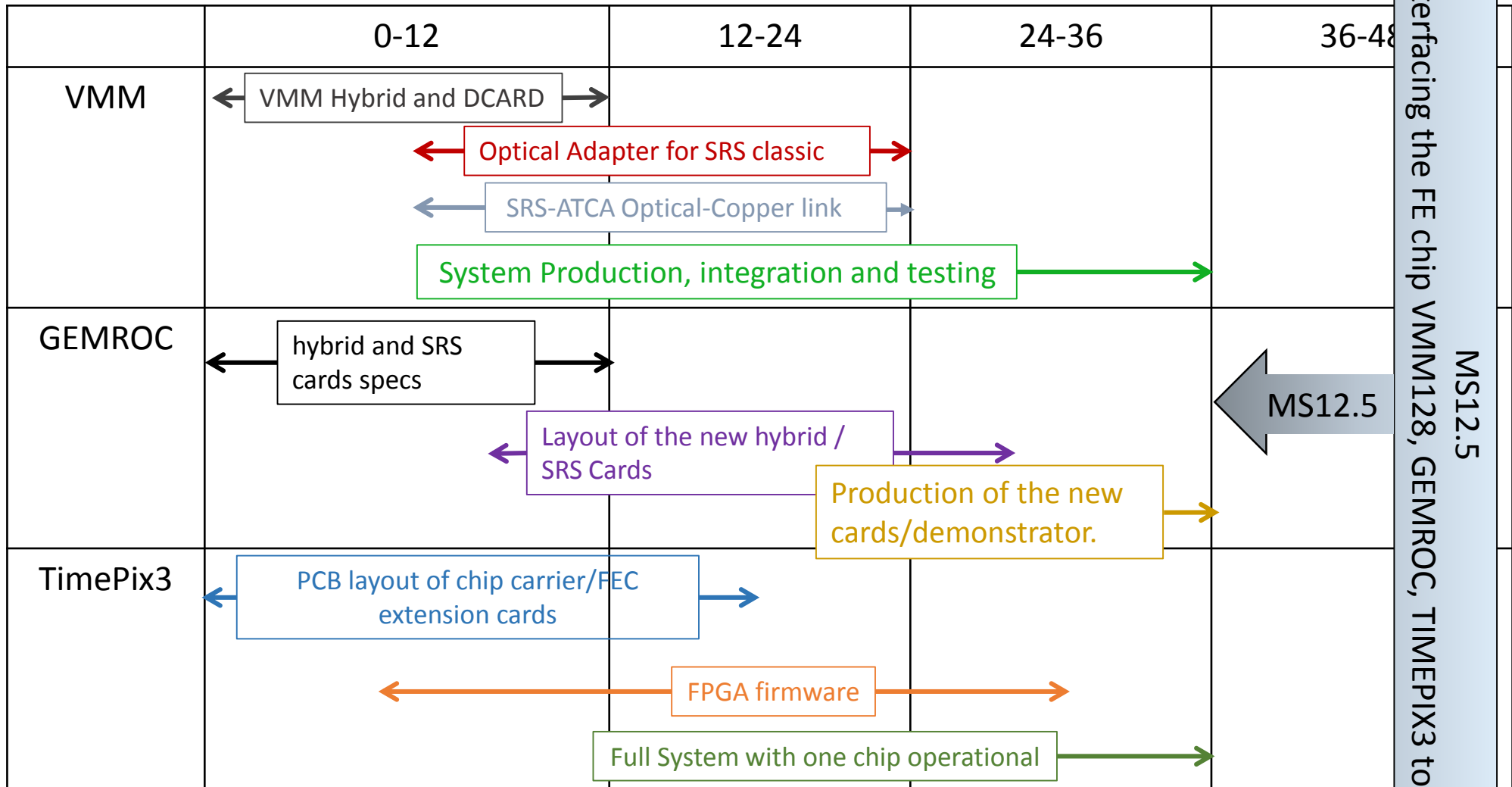
- Readout of at least one TimePix3 per FEC
- Multi-chip readout will be studied
- Optical Transmission for faster data transmission will be considered



# Partners

Task	Ref. Institute/Person
Timepix3	University of Bonn: K. Desch, J. Kaminski
VMM	CERN: H. Muller, E. Oliveri
GEMROC	AGH Krakow: B. Mindur CERN: E. Oliveri

# 4y Planning (& milestones)



(Interfacing the FE chip VMM128, GEMROC, TIMEPIX3 to SRS)

MS12.5

# 1<sup>st</sup>y Activities

- VMM
- VMM Hybrid and DCARD designing, production and testing.
  - Designing of the Optical cards (ATCA and adapter for SRS classic).
- GEMROC
- Define hybrid and SRS cards specification.
  - Start the layout of the new hybrid / SRS Cards.
- TimePix3
- PCB layout of chip carrier/FEC extension cards

# Budget

## AIDA 2 - WP Frontier Gas Detectors - Task 12.3.1: Tools to ease the detector progress: interfacing FE-chips specific to gas detectors to th

For input data, only fill the white areas below

Please fill out the Beneficiary and Institute short name columns (see example below for CERN and INFN)

Beneficiary short name*	Institute	Person - months	Monthly personnel costs	Personnel direct costs	Travel direct costs	Equipment and consumables	Other direct costs	Sub-contracting costs
CERN		10.00	7,300.00	73,000.00	10,000.00	21,600.00		
<b>Total</b>		<b>10.00</b>	<b>7,300.00</b>	<b>73,000.00</b>	<b>10,000.00</b>	<b>21,600.00</b>	<b>0.00</b>	<b>0.00</b>

## scalable Read-out System

Material direct costs	Total direct costs	Total indirect costs**	Total costs (direct + indirect)	EC requested funding	Description of Partner Contribution to the Task
31,600.00	104,600.00	26,150.00	130,750.00	50,000.00	task responsibility and coordination (3 institutes in total)
<b>31,600.00</b>	<b>104,600.00</b>	<b>26,150.00</b>	<b>130,750.00</b>	<b>50,000.00</b>	

The AIDA2020020 support to the VMM integration in the SRS will contribute to the main activities and developments actively supported by the ATLAS NSW project and RD51. The European Spallation Source will contribute also to this integration.