## DAQ System at **BM@N** facility

BM@N DAQ group: A. Baskakov, S. Bazylev, A. Fediunin, I. Filippov, S. Kuklin, Yu. Minaev, A. Shchipunov, A. Shutov, I. Slepnev, V. Slepnev, N. Tarasov, A. Terletskiy



### Hardware TDC modules

72 and 64-channel multihit timestamping TDCs VME64x U6 boards Based on HPTDC chips Resolution:

- 25 ps for TDC72VHL and TDC64VHLE
- 100 ps for TDC64V

TTC Bus for synchronization into VME crate Power supply via VME Bus Data transferring via VME64x Bus Input signals formats:

- LVDS for TDC72VHL and TDC64VHLE
- ECL, PECL or LVDS for TDC64V



**TDC64V** for DCH

### Hardware ADC modules

62,5 Msps 12 bit 64-cannel ADC modules DSP function:

- Zero suppression, Tail cancellation, Moving average filter for calorimetry
- + Sparse readout for GEM & STS

Power supply:

- External (Wiener Mpod) for ADC64s2
- VME Bus for ADC64VE

Data transfer:

- WR link for ADC64s2 (Ethernet in future)
- Ethernet link for ADC64VE Synchronization:
  - Lemo TTL I/O for Trigger and XOFF signals
  - WR Link for timing synchronization



ADC64VE for GEM, STS



ADC64s2 for Ecal, ZDC

#### Hardware VME64x control and interface modules

FVME2TMWR – Trigger, Timing and Control Module for VMEDAQ system

- TTC Bus master. Generate and distribute clock, trigger and spill signals
- WR synchronization
- 4 software configurable TLL I/O

FVME2 – VME64x Bus Master and system controller. Read out data from VME modules into the crate and transfer it by optical link to Pexml-4

Pexml-4 – PCI Express interface card with M-Link protocol







### **Global Trigger Unit**

GTU based on UT24VE module. It distributes Trigger & Spill signals to all LTU and collects XOFF signals form them.





- Ethernet Interface
- 24 LEMO I/O

Lemo I/O	Left side	Right side
23 24	Spill in	Spill out
21 22	Trig in4	XOFF out
19 20	Trig in3	Trig out3
17 18	Trig in2	Trig out2
15 16	Trig in1	Trig out1
13 14	XOFF in13	XOFF in14
1 2	XOFF in1	XOFF in2

## Local Trigger Unit and DCH DAQ

LTU also based on UT24VE module and distributes Trigger & Spill signals to subsytem's modules and collects XOFF signals form them.



## **Ecal DAQ**

- Trigger signals to each ADC64s2 board from cascaded Fanouts via coaxial cables.
- XOFF signals from each ADC64s2 board to cascaded LTUs.
- Every ADC64s2 connected to WR Switch for timing synchronization.
- Optical links to Ethernet switch for data transmission.

#### **Stand-alone systems:**

- ECal
- ZDC



**MWPC DAQ** 

- **HRB6ASD** modules • located at MWPC
- TTB9V modules synchronize HRB6ASDs via HRB TTC Links
- Data transfering derives • by Ethernet links





U40VE – universal logical module. It used for control detector's front-end electronics.

**U40VE** 

Mixed systems:

• GEM

• STS



## **Data flow**



## **Global Run Control**

Run Control #G

Run Control tasks:

- Configure Trigger Unit
- Start/stop run

DRE

- Send start/stop signals to all clients
- Check client's status.



## **VME Run Control**

VmeDaq tasks:

- Recieves start/stop signals from Run Control.
- Writes confiruration into modules
- Retransmit data from DRE to EvB.

VmeDaq

DRE

VmeGui



## **ADC64 Run Control**

ADC64 System tasks:

- Write configuration into devices.
- Execute mstream program (perform FLP function).

**ADC64 System** 

Local Run Control

FLP

mstream

• Check board's status.

ADC64

DRE

<u>ne</u> optio <u>n</u> s	Traib															
PID-unuuu	or ( i	Readout W	lindow	DSP			anna d-	ulaan								
Freampline		Readout W	muow	D3F		Chi	ange de	vices								
		Size	1000 ‡			A	DC64VE	076D-08	B9 29.	.9 °C 1.0	0.231	74 65-12	28 Onlin Onlin	e Adc loc	k Ok	
		Latency	980 🌲			n E	000472	. 0700-05	00 50		0.2.01	4 1.04	U.I.I.I	e Mac loc	N OK	
	0	Trigger														
Invert sign	nal	Timer			8											
		Thr.														
		✓ Lemo	(TTL)			0										
				Zeros	uppr.											
						4										Þ
Start	Stop	Write	file	Channels s	etup All	l channels (1	-128) 👻									
1 000																_
1,000 -																
1																
800 -																
600 -																
1																
400 -																
200																
200 -																
1																
0																
		-							-	-			,	-	-	_
		20	00		400			600		,	,	800	Ev 0			1.000
	File Options Type 1 ADC64VE	20 Help Serial S 030D-CF31 7	lot IP Address 10.18.40.146	t.*C E ADC:24 PS:22 4	Vent Trig on 3	ADC64 XOff ADC State Ok	4 System #	GEM Offset	Link	Unlock 0 C	RX Err	Event rate	Ev 0	te up time 601554	LM res	1.00( - °
<u> </u>	File Options Type 1 ADC64VE 2 ADC64VE	2 ( Help Serial S 030D-CF31 7 076C-828E 9	lot IP Address 10.18.40.146 10.18.40.145	t. *C E ADC:24 P5:22 4 ADC:24 P5:22 4	vent Trig on 3 0 0	XOF ADC 544t Ok Ok	4 System # us WR Ti	GEM	Link	Unlock 0 C	RX Err	Event rate 0	Ev 0	te up time 601554 601554	LM res 0 0	1.000 ets
<u> </u>	File Options Type 1 ADC64VE 2 ADC64VE 3 ADC64VE	Elp Serial S 030D-CF31 7 076C-828E 9 076C-8320 9	lot IP Address 10.18.40.146 10.18.40.145 10.18.40.135	t.*C E ADC:24 PS:22 4 ADC:24 PS:22 4 ADC:29 PS:25 4	Vent Trig on 2 0 0 0	ADC64 XOFF ADC Statu Ok Ok Ok	4 System #1	GEM	Link 0 0	Unlock 0 C 0 C	RX Err	Event rate 0 0	EV 0	te up time 601554 601554 601553	LM res 0 0 0	1.00
 Global	Elle gptions Type 1 ADC64VE 2 ADC64VE 3 ADC64VE 4 ADC64VE 6 ADC64VE	2( <u>Help</u> Serial S 030D-CF31 7 076C-828E 9 076C-828E 9 076C-826E 10 076C-826E 10	lot IP Address 10.18.40.146 10.18.40.145 10.18.40.135 10.18.40.139	t.*C E ADC:24 PS:22 4 ADC:24 PS:22 4 ADC:29 PS:25 4 ADC:30 PS:27 4	vent Trig on 3 0 0 0 0	XOIF ADC State Ok Ok Ok Ok	4 System #	GEM GEM Offset			RX Err	Event rate 0 0 0	Ev 0	te up time 601554 601553 601553 601553	LM res 0 0 0	1.00
 Biobal	Elle         Options           Type         1           ADC64VE         2           ADC64VE         3           ADC64VE         4           ADC64VE         4           6         ADC64VE	2( Help Serial S 030D-CF31 7 076C-828E 9 076C-826E 9 076C-826E 13 076C-826F 19 076C-826F 19	lot IP Address 10.18.40.146 10.18.40.135 10.18.40.139 10.18.40.139 10.18.40.139	t, *C E ADC:24 PS:22 4 ADC:24 PS:22 4 ADC:30 PS:27 4 ADC:30 PS:27 4 ADC:30 PS:27 4	vent Trig on 3 0 0 0 0 0 0 0 0	XOFF ADC State Ok Ok Ok Ok Ok	4 System #	GEM GEM			RX Err	Event rate 0 0 0 0	EV 0	te up time 601554 601554 601553 601553 601553 601553	LM res 0 0 0 0 0	1.00
lobal	Elle Options Elle Options Type 1 ADC44VE 2 ADC64VE 3 ADC64VE 4 ADC64VE 6 ADC64VE 6 ADC64VE 7 ADC64VE	Help Serial S 030D-CF31 7 076C-828E 9 076C-828E 9 076C-828E 19 076C-826E 19 076C-826E 10 076C-828B 5	Iot         IP Address           10.18.40.146         10.18.40.135           10.18.40.135         10.18.40.134           10.18.40.134         10.18.40.143           10.18.40.134         10.18.40.143	t.*C E ADC:24 PS:22 4 ADC:24 PS:22 4 ADC:30 PS:25 4 ADC:30 PS:25 4 ADC:30 PS:25 4 ADC:30 PS:25 4 ADC:31 PS:27 4	Yent         Trig on 3           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0	XOFF ADC State Ok Ok Ok Ok Ok Ok Ok	4 System #	GEM		Uniock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0	RX Err	Event rate 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601553	LM res 0 0 0 0 0 0 0 0	1.00
Jobal FyB	Ele         Options           Type         1           1         ADC64VE           2         ADC64VE           3         ADC64VE           4         ADC64VE           5         ADC64VE           6         ADC64VE           7         ADC64VE           6         ADC64VE           6         ADC64VE	Eelip Serial S 030C-CF31 7 076C-8326 9 076C-8266 13 076C-826 19 076C-826 19 076C-826 10 076C-826 10 076C-8320 9 076C-8300 10	lot IP Address 10.18.40.146 10.18.40.145 10.18.40.139 10.18.40.133 10.18.40.143 10.18.40.144 10.18.40.144	t.*C E ADC:24 PS:22 4 ADC:24 PS:22 4 ADC:32 PS:25 4 ADC:30 PS:27 4 ADC:30 PS:27 4 ADC:30 PS:27 4 ADC:30 PS:27 4 ADC:31 PS:27 4	vent Trig on 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	XOFF ADC 54atr Ok Ok Ok Ok Ok Ok Ok Ok Ok	4 System #	GEM	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0	RX Err	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601553 601554	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
lobal EvB	Elle Options Type 2 ADC64VE 3 ADC64VE 4 ADC64VE 5 ADC64VE 6 ADC64VE 6 ADC64VE 8 ADC64VE 0 ADC64VE 0 ADC64VE 1	20 Serial S 030D-CF31 7 076C-8280 9 076C-8280 9 076C-8261 19 076C-8261 19 076C-8688 5 076C-8868 5 076C-8401 10 076C-0411 10	bt IP Address 10.18.40.146 10.18.40.146 10.18.40.145 10.18.40.135 10.18.40.139 10.18.40.143 10.18.40.140 10.18.40.140	t.*C E ADC:24 P5:22 4 ADC:24 P5:22 4 ADC:30 P5:27 4 ADC:30 P5:27 4 ADC:30 P5:27 4 ADC:31 P5:27 4 ADC:30 P5:25 4 ADC:30 P5:25 4 ADC:30 P5:25 4	Yent         Trig on 3           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0	ADC64 XOH ADC Statu Ok	4 System #	GEM GEM Offset	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0	RX Err	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev O	te up time 601554 601553 601553 601553 601553 601554 601554	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Blobal EvB	Elle Spitons Type 1 ADC64VE 3 ADC64VE 4 ADC64VE 6 ADC64VE 6 ADC64VE 9 ADC64VE 9 ADC64VE 10 ADC64VE 10 ADC64VE	2( Serial S 0300-CF31 7 0766-8320 9 0766-8320 9 0766-8320 10 0766-8401 10 0766-8401 10 0766-8401 7 0766-0411 0 0766-0415 5	Int         IP Address           10.18.40.146         10.18.40.145           10.18.40.145         10.18.40.143           10.18.40.143         10.18.40.143           10.18.40.143         10.18.40.144           10.18.40.144         10.18.40.144           10.18.40.144         10.18.40.144           10.18.40.144         10.18.40.144	L'C E ADC:24 P5:22 4 ADC:24 P5:22 4 ADC:29 P5:25 4 ADC:39 P5:25 4 ADC:39 P5:25 4 ADC:39 P5:26 4 ADC:39 P5:26 4 ADC:29 P5:26 4 ADC:27 8 4	Trig on 2           0	ADC64 XOIF ADC State OK OK OK OK OK OK OK OK OK	4 System #	GGEM	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Uniock 0 0 C C 0 C C C C	RX Err ) ) ) ) ) )	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev O	te up time 601554 601553 601553 601553 601553 601554 601554 601554 601554	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 9 ets
blobal EvB	Ele         Options           Type         Type           1         ADC64VE           2         ADC64VE           3         ADC64VE           4         ADC64VE           5         ADC64VE           6         ADC64VE           6         ADC64VE           6         ADC64VE           9         ADC64VE           10         ADC64VE           11         ADC64VE	Help           Serial         5           0300-C731         7           076C-8326         9           076C-4326         13           076C-4326         13           076C-4326         13           076C-6326         10           076C-8436         10           076C-8436         10           076C-8436         11           076C-8431         10           076C-843	Image: Description of the second se	L <sup>1</sup> C E ADC:24 F522 4 ADC:29 F522 4 ADC:29 F522 4 ADC:30 F527 4 ADC:30 F527 4 ADC:30 F527 4 ADC:30 F525 4 ADC:31 F527 4 ADC:31 F527 4 ADC:29 F526 4 ADC:20 F526 4	Vent Trig on 2 0 0 0 0 0 0 0 0 0 0 0 0 0	ADC64 XXOFf ADC State Ok Ok Ok Ok Ok Ok Ok Ok Ok Ok Ok Ok	4 System #	GEM	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Uniock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0	RX Err	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601553 601554 601553 601555 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 0
Blobal EvB	Ele         Options           1         ADCGAV           2         ADCGAV           3         ADCGAV           4         ADCGAV           5         ADCGAV           6         ADCGAV           0         ADCGAV           1         ADCGAV           1         ADCGAV           1         ADCGAV           1         ADCGAV	Help         Serial         S           Serial         S         0300-C731         7           076C-8226         9         076C-8226         9           076C-8262         9         076C-8262         9           076C-8260         10         076C-8263         9           076C-8261         10         076C-8263         9           076C-8261         10         076C-8263         10           076C-8261         5         076C-8263         5           076C-8263         5         076C-8263         10           076C-8263         10         076C-8263         10           076C-8263         10         076C-8263         10           076C-8263         10         076C-8263         10	Image: Image and the state of the	L*C         E           ADC:24 P5:22 4         ADC:24 P5:22 4           ADC:24 P5:22 4         ADC:29 P5:25 4           ADC:24 P5:27 4         ADC:29 P5:27 4           ADC:25 P5:26 4         ADC:29 P5:27 4           ADC:26 P5:21 4         ADC:29 P5:21 4           ADC:29 P5:22 4         ADC:29 P5:22 4	400  vent Trig on 2	ADC 54ah OK OK OK OK OK OK OK OK OK OK OK OK	4 System #	GEM Offset	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601553 601554 601553 601555 601555 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 0
Blobal EvB	Ele         Optimis           1         ADCGAV           2         ADCGAV           3         ADCGAV           4         ADCGAV           5         ADCGAV           6         ADCGAV           10         ADCGAV           11         ADCGAVE           12         ADCGAVE           12         ADCGAVE	Help           Serial         5           030D-CF31         7           076C-8320         9           076C-8320         10           076C-8320	bt         P Address           10.18.40.146         10.8.40.146           10.18.40.145         10.18.40.139           10.18.40.139         10.18.40.139           10.18.40.139         10.18.40.139           10.18.40.137         10.18.40.131           10.18.40.137         10.18.40.141           10.18.40.141         10.18.40.141           10.18.40.141         10.18.40.141           10.18.40.142         10.18.40.143           10.18.40.143         10.18.40.143           10.18.40.143         10.18.40.144           10.18.40.144         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144           10.18.40.145         10.18.40.144	L'C E ADC:24 P522 4 ADC:24 P522 4 ADC:29 P524 4 ADC:30 P527 4 ADC:30 P527 4 ADC:30 P527 4 ADC:30 P527 4 ADC:31 P527 4 ADC:29 P526 4 ADC:20 P526 4	Yeart         Trig on 3           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0	ADC64 XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	\$ System #	GEM GEM ime Offset 075c-BABB	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Uniock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0 Data ra	te up time 601554 601553 601553 601553 601553 601553 601553 601554 601553 601554 601555 601554 601555 601554 601554 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 0
Blobal EvB	Еle Gptiess     Тура     Тура     Тура     Тура     Тура     Тура     Торона     Т	21 Serial S Serial S 300-C731 5 076C-8282 9 076C-8282 9 076C-8282 9 076C-826 10 076C-826	bt P Address. 10.18.40.146 10.18.40.145 10.18.40.145 10.18.40.145 10.18.40.135 10.18.40.137 1	L <sup>1</sup> C E ADC24 P522 4 ADC24 P522 4 ADC24 P522 4 ADC20 P523 4 ADC30 P527 4 ADC30 P527 4 ADC30 P527 4 ADC30 P526 4 ADC28 P521 4 ADC28 P521 4 ADC29 P526	Vent         Trig on 2           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0	ADC65 XOH ADC State OK OK OK OK OK OK OK OK OK OK OK OK	4 System #	GEM GEM Offset	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C C C C C C C C C C C C C C C C C C	RX Err ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) ) )	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0 Data rz	te up time 601554 601554 601553 601553 601553 601554 601555 601555 601554 076D-0889	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- 0 ets
Blobal EvB	Ele         Optimis           7/98         1         ACCEAV           2         ACCEAV         3           4         ACCEAV         5         ACCEAV           5         ACCEAV         6         ACCEAV           6         ACCEAV         10         ACCEAV           10         ACCEAV         12         ACCEAV           12         ACCEAV         12         ACCEAV           12         ACCEAV         12         ACCEAV	Help           Serial         5           3000-CF31         5           076C-828E         9           076D-8108         10           076D-8108         10           076D-8108         10           076D-8108         10 <td>bt P Address 10.18.40.145 10.18.40.145 10.18.40.145 10.18.40.139 10.18.40.139 10.18.40.139 10.18.40.143 10.18.40.141 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.145 10</td> <td>L<sup>1</sup>C 24 ADC2479522 4 ADC2379523 4 ADC307527 4 ADC307527 4 ADC307527 4 ADC307523 6 ADC307523 6 ADC207526 4 ADC207526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC207556 4 ADC207556 4 ADC207556 4 ADC207556 4 ADC207556 4</td> <td>Vent         Trig on 1           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 /</td> <td>ADC64 XOIF ADC State OK OK</td> <td>3 System ≠ us WR Ti</td> <td>GEM GEM Offset Offset</td> <td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C</td> <td>RX Err ) ) ) ) ) ) ) ) ) ) ) ) )</td> <td>Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>Data re</td> <td>te up time 601554 601553 601553 601553 601553 601554 601553 601554 601553 601554 601555 601555</td> <td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>1.000</td>	bt P Address 10.18.40.145 10.18.40.145 10.18.40.145 10.18.40.139 10.18.40.139 10.18.40.139 10.18.40.143 10.18.40.141 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.142 10.18.40.145 10	L <sup>1</sup> C 24 ADC2479522 4 ADC2379523 4 ADC307527 4 ADC307527 4 ADC307527 4 ADC307523 6 ADC307523 6 ADC207526 4 ADC207526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC2075526 4 ADC207556 4 ADC207556 4 ADC207556 4 ADC207556 4 ADC207556 4	Vent         Trig on 1           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 /	ADC64 XOIF ADC State OK	3 System ≠ us WR Ti	GEM GEM Offset Offset	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err ) ) ) ) ) ) ) ) ) ) ) ) )	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0	Data re	te up time 601554 601553 601553 601553 601553 601554 601553 601554 601553 601554 601555 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Biobal EvB	Elle         Options           1         ADCGMV           3         ADCGMV           4         ADCGMV           6         ADCGMV           7         ADCGMV           10         ADCGMV           11         ADCGMV           12         ADCGMV           13         ADCGMV           14         ADCGMV           15         ADCGMV           16         SOCGMV           17         ADCGMV           18         ADCGMV           11         ADCGMV           11         ADCGMV           11         ADCGMV           11         ADCGMV           11         ADCGMV           12         ADCGMV           13         ADCGMV           14         ADCGMV	Help           Serial         5           0300-CF31         7           0766-828         9           0766-828         9           0766-826         13           0766-826         13           0766-826         13           0766-826         13           0766-826         14           0766-826         15           0766-6385         16           0766-6385         16           0766-6385         16           0766-6385         16           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11           14-33.001         11	bt PAddress 10.8.40.146 10.8.40.146 10.8.40.145 10.8.40.145 10.8.40.145 10.8.40.145 10.8.40.145 10.8.40.149 10.8.	L <sup>1</sup> C E ADC247522 4 ADC297522 4 ADC297525 4 ADC297525 4 ADC297525 4 ADC297525 4 ADC297525 4 ADC297526 4 ADC297527 4 ADC297526 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC29756 4 ADC297	vent Trig on 2     vent Trig on 2     o	ADC64 X0/f ADC Stant Ok	4 System 40 us WR TI 76C-89C0	GEM GEM Offset 0 076c-BABB	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Uniock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err 	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0 Data re	te up time 601554 601553 601553 601553 601553 601554 601555 601555 601555 601553 601554 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Biobal EvB	Ele         Optimization           1         ADCGMV           2         ADCGMV           3         ADCGMV           4         ADCGMV           5         ADCGMV           6         ADCGMV           7         ADCGMV           8         ADCGMV           10         ADCGMV           11         ADCGMV           12         ADCGMV           13         ADCGMV           14         ADCGMV           15         ADCGMV           16         ADCGMV           16         ADCGMV           17         ADCGMV           18         ADCGMV           19         ADCGMV           10	Help           Serial         5           0300-C751         7           076C-8226         13           076C-8226         13           076C-8252         10           076C-8252         11           14         14           14         14           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10           14         10	Image: bit is a start of the start	L, C 2 4 5/22 4 AOC:24 5/22 4 AOC:24 5/22 4 AOC:39 5/23 4 AOC:39 5/23 4 AOC:39 5/23 4 AOC:39 5/23 4 AOC:39 5/23 4 AOC:39 5/23 4 AOC:39 5/26 4 AOC:30 5/26 4	Yeart         Trig on 3           0         0           0         <	ADC64 X0/f ADC State Ok	4 System # us WR TI 76C-89C0	GEM GEM Offset 075C-BABB	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C C C C C C C C C C C C C C C C C C	RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601553 601553 601553 601553 601553 601554 0760-0889	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Biobal EvB	Ele         Spring           1         ADCGAV           2         ADCGAV           3         ADCGAV           4         ADCGAV           5         ADCGAV           6         ADCGAV           7         ADCGAV           8         ADCGAV           11         ADCGAV           12         ADCGAV           0         Statt           ©         Statt	24 560	bt P Address 10.18.0.146 10.18.0.146 10.18.0.146 10.18.0.135 10.18.0.135 10.18.0.135 10.18.0.135 10.18.0.135 10.18.0.137 10.18.0.137 10.18.0.137 10.18.0.147 10.1	L <sup>1</sup> C E E ADC24 P522 4 ADC24 P522 4 ADC29 P525 4 ADC32 P525 4 ADC32 P525 4 ADC30 P526 4 ADC30 P5	Vent         Trig on 3           0         0           0 <t< td=""><td>ADC65 X0/f ADC State OK OK</td><td>us WR TI</td><td>GEM GEM Offset 076C-BABB</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 C C C C C C C C C C C C C C C C C C</td><td>RX Err </td><td>Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Ev 0</td><td>te up time 601554 601553 601553 601553 601553 601554 601555 601555 601555 601555 601555</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>1.000</td></t<>	ADC65 X0/f ADC State OK	us WR TI	GEM GEM Offset 076C-BABB	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C C C C C C C C C C C C C C C C C C	RX Err 	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Ev 0	te up time 601554 601553 601553 601553 601553 601554 601555 601555 601555 601555 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Biobal EvB	Ele         Optimis           1         ADCGMV           2         ADCGMV           3         ADCGMV           4         ADCGMV           5         ADCGMV           6         ADCGMV           7         ADCGMV           10         ADCGMV           11         ADCGMV           12         ADCGMV           13         ADCGMV           14         ADCGMV           15         ADCGMV           16         ADCGMV           17         ADCGMV           16         ADCGMV           17         ADCGMV           18         ADCGMV           19         ADCGMV           10	21 Help Serial S 0300-C731 7 076C-828E 9 076C-828E 9 076C-828E 9 076C-8488 5 076C-8488 5	Image: Participant Control           International Contrel	L <sup>1</sup> C 2 ADC24 #522 4 ADC24 #522 4 ADC23 #525 4 ADC30 #527 4 ADC30 #527 4 ADC30 #527 4 ADC32 #526 4 ADC30 #527 4 ADC30 #527 4 ADC28 526 4 ADC28 526 4 ADC28 526 4 ADC28 526 4 ADC29 #526 4 ADC29 #526 4 ADC29 #526 4 ADC29 #526 4 ADC29 #526 4 ADC29 #526 4 ADC29 *526	vent Trig on J      vent Trig on J      vent Trig on J      vent Vent Vent Vent Vent Vent Vent Vent V	ADC64 X0/f ADC State Ok	3 System #4 Syst	GEM GEM Offset	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 0 C 0 C	RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3	Event rate     0	Ev 0	te up time 601554 601554 601553 601553 601553 601554 601555 601553 601554 001554 001554	LM res	1.000
Slobal EvB	Ele         Sptim           1         ADCGAV           3         ADCGAV           4         ADCGAV           5         ADCGAV           6         ADCGAV           0         ADCGAV           1         ADCGAV           11         ADCGAVE           12         ADCGAVE           13         ADCGAVE           14         ADCGAVE           15         ADCGAVE           16         ADCGAVE           17         ADCGAVE           18         ADCGAVE           14         ADCGAVE           15         ADCGAVE           16         ADCGAVE           17         ADCGAVE           18         ADCGAVE           19         ADCGAVE           10         ADCGAVE           11         ADCGAVE           12         ADCGAVE           13         ADCGAVE           14         ADCGAVE           15         ADCGAVE           16         ADCGAVE	24 560 561 5 50300-C731 7 076C-8282 9 076C-8282 9 076C-8282 9 076C-8282 9 076C-8282 9 076C-8282 0 076C-828 12 076C-0410 7 076C-0411 10 076C-0411 10 076C-0410 10 076C-0400 10 076C-0400	bt P Address 10.18.40.146 10.18.40.145 10.18.40.145 10.18.40.145 10.18.40.135 10.18.40.135 10.18.40.135 10.18.40.136 10.18.40.141 10.18.40.140 10	L <sup>1</sup> C E E ADC24 P522 4 ADC24 P522 4 ADC29 P525 4 ADC29 P525 4 ADC39 P526 4 ADC39 P5	Vent         Trig on J           0         0           0 <t< td=""><td>ADC65 X0/f ADC State OK OK</td><td>9 3 System # 4</td><td>GEM GEM Offset 075C-BABB</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C</td><td>RX Err</td><td>H     B00     C</td><td>EV 0</td><td>te up time 601554 601553 601553 601553 601553 601554 601555 601555 601555 601553 601554 601555</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>1.00( ets</td></t<>	ADC65 X0/f ADC State OK	9 3 System # 4	GEM GEM Offset 075C-BABB	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err	H     B00     C	EV 0	te up time 601554 601553 601553 601553 601553 601554 601555 601555 601555 601553 601554 601555	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00( ets
iobal EvB	Ele         Optimization           1         ADGC6W1           2         ADGC6W1           3         ADGC6W1           4         ADGC6W1           5         ADGC6W1           6         ADGC6W1           0         ADGC6W1           10         ADGC6W1           10         ADGC6W1           11         ADGC6W1           12         ADGC6W1           14         ADGC6W1           15         ADGC6W1           16         State           17         ADGC6W1           18         State           19         State	24	Image: state in the s	L <sup>1</sup> C 2 ADC24 PS22 4 ADC24 PS22 4 ADC24 PS25 4 ADC29 PS25 4 ADC29 PS25 4 ADC29 PS26 4 ADC20 ADC20 ADC20 ADC20 4 ADC20 ADC20	Yent         Trig on J           0         0           0 <t< td=""><td>ADC64 X007 ADC State OK OK</td><td>1 System #1</td><td>GEM GEM Offset 076c-BABB</td><td>Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3</td><td>Event rate     0</td><td>EV 0</td><td>te up time 601554 601553 601553 601553 601553 601553 601554 601553 601554 601555 601554 0760-0889</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>1.000</td></t<>	ADC64 X007 ADC State OK	1 System #1	GEM GEM Offset 076c-BABB	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3	Event rate     0	EV 0	te up time 601554 601553 601553 601553 601553 601553 601554 601553 601554 601555 601554 0760-0889	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
Biobal EvB	Ele         Sprim           1         ADCGMV           3         ADCGMV           4         ADCGMV           5         ADCGMV           6         ADCGMV           1         ADCGMV <td>24 560 - 25</td> <td>Image: Description of the second se</td> <td>L<sup>1</sup>C E ADC24 P522 4 ADC24 P522 4 ADC24 P522 4 ADC20 P523 4 ADC30 P523 4 ADC29 P526 4 ADC29 P526</td> <td>Vent         Trig on J           0         0           0         <t< td=""><td>ADC 64 XOFf ADC State OK OK</td><td>1 System # 1 us WR TR US WR TR 15 756:1820</td><td>GEM Ime Offset</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0</td><td>RX Err </td><td>Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>EV 0</td><td>te up time 601554 601553 601553 601553 601553 601553 601554 601554 0760-0889</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ets</td></t<></td>	24 560 - 25	Image: Description of the second se	L <sup>1</sup> C E ADC24 P522 4 ADC24 P522 4 ADC24 P522 4 ADC20 P523 4 ADC30 P523 4 ADC29 P526	Vent         Trig on J           0         0           0 <t< td=""><td>ADC 64 XOFf ADC State OK OK</td><td>1 System # 1 us WR TR US WR TR 15 756:1820</td><td>GEM Ime Offset</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0</td><td>RX Err </td><td>Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>EV 0</td><td>te up time 601554 601553 601553 601553 601553 601553 601554 601554 0760-0889</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ets</td></t<>	ADC 64 XOFf ADC State OK	1 System # 1 us WR TR US WR TR 15 756:1820	GEM Ime Offset	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0	RX Err 	Event rate 0 0 0 0 0 0 0 0 0 0 0 0 0	EV 0	te up time 601554 601553 601553 601553 601553 601553 601554 601554 0760-0889	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ets
iobal EvB	Ele         Optime           1         ADCGAV           2         ADCGAV           3         ADCGAV           4         ADCGAV           5         ADCGAV           6         ADCGAV           0         ADCGAV           1         ADCGAV           10         ADCGAV           12         ADCGAV           12         ADCGAV           13         ADCGAV           14         ADCGAV           15         ADCGAV           16         ADCGAV           16         ADCGAV           16         ADCGAV           17         ADCGAV           18         ADCGAV           19         ADCGAV           10         ADCGAV           11         ADCGAV           12         ADCGAV           13         ADCGAV           14         ADCGAV           14         ADCGAV           15         ADCGAV           16         ADCGAV           17         ADCGAV           10         ADCGAV           10         ADCGAV           10	Help  Serial 5 000-CF31 7 0076-0380 0766-0380 0766-0380 0766-0380 0766-0480 0766-0480 0766-0480 0766-0480 0766-0480 0766-0481 0 0766-0481 0 0766-0481 0 0766-0481 0 0766-0481 0 0766-0481 0 0766-0481 0 0766-0481 0 0766-048 0 0 0766-048 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Image: state of the s	L'C E E L'C E E ACC24 P522 4 ACC24 P522 4 ACC30 P525 4 ACC30 P525 4 ACC30 P525 4 ACC30 P525 4 ACC30 P526 4 A	Yent         Trig on J           0         0           0 <t< td=""><td>ADC 64 X007 ADC 54ab OK OK</td><td>1 System #1</td><td>600</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Undeck Undeck Un</td><td>RX Err ) ) ) ) ) ) ) ) ) ) ) ) )</td><td>Event rate     0</td><td>EV 0</td><td>te uptime 60154 60154 60153 60153 60153 601553 601553 601553 601554 601553 601554 601553 601554 601554 601554 601554 601554 601554 601554 601554 60156 6000 60156</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>ets</td></t<>	ADC 64 X007 ADC 54ab OK	1 System #1	600	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Undeck Un	RX Err ) ) ) ) ) ) ) ) ) ) ) ) )	Event rate     0	EV 0	te uptime 60154 60154 60153 60153 60153 601553 601553 601553 601554 601553 601554 601553 601554 601554 601554 601554 601554 601554 601554 601554 60156 6000 60156	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ets
ilobal EvB	Ele         Optimis           1         ADCGAV           2         ADCGAV           3         ADCGAV           4         ADCGAV           4         ADCGAV           6         ADCGAV           0         ADCGAV           0         ADCGAV           10         ADCGAV           12         ADCGAVE           13         ADCGAVE           0         Start           0         Start	24 5600 - 273 7 0000 - 273 7 0766-828 0 0766-828 0 0766-828 0 0766-828 0 0766-828 0 0766-828 0 0766-848 0 0766-948 0 0769-948 0	bt         IP Address           10.18.40.146         10.18.40.146           10.18.40.145         10.18.40.145           10.18.40.145         10.18.40.145           10.18.40.145         10.18.40.145           10.18.40.145         10.18.40.145           10.18.40.145         10.18.40.145           10.18.40.145         10.18.40.145           10.18.40.146         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.146         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147           10.18.40.147         10.18.40.147	L <sup>1</sup> C E C AOC24 F522 4 AOC24 F522 4 AOC29 F523 4 AOC30 F523 4 AOC26 F524 4 AOC26 F526 4 AOC26 F526 4 AOC26 F526 4 AOC26 F526 4 AOC26 F526 4 C C C C C C C C C C C C C C C C C C C	Yent         Trig on 2           0         0      0         0	ADC64 X0ff ADC State OK	1 System # 19 45 Will To 766-Baco	GEM OTHER OTHER	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	H     800     762CE3E5	EV 0	te optime 60354 60353 60353 60353 60353 60353 60354 603554 60354 6056 60356 6056 60	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
iobal EvB	Ele         Optimis           2         ADCGAVE           3         ADCGAVE           4         ADCGAVE           5         ADCGAVE           6         ADCGAVE           10         ADCGAVE           10         ADCGAVE           10         ADCGAVE           10         ADCGAVE           11         ADCGAVE           12         ADCGAVE           10         ADCGAVE           10         ADCGAVE           11         ADCGAVE           12         ADCGAVE           13         ADCGAVE           14         ADCGAVE	Help Serial 5 0300-CF31 7 0766-0320 9 0766-0320 9 0766-0320 10 0766-0320 10 0766-0320 10 0766-0320 10 0766-0320 10 0766-0320 10 14-003100 14-003100 14-00310000000000000000000000000000	bit         IP Address           10.18.40.144         10.18.40.145           10.18.40.145         10.18.40.145	L'C E E L'C E E ADC:24 P522 4 ADC:39 P527 4 ADC:39 P527 4 ADC:39 P527 4 ADC:39 P527 4 ADC:30 P525 4 ADC:30 P526 4 ADC:30 P526 4 ADC:39 P52	Vent         Trig on 1           0         0           0 <t< td=""><td>ADC64 X007 ADC State OK OK</td><td>3 System #1</td><td>GEM</td><td>Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 C C 0 C C C C</td><td>RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3</td><td>H     BOO     Event rate     Event attempt     O</td><td>EV 0</td><td>I         op time           60354         60354           60354         60353           60353         60353           60354         60354           60354         60354           60354         60354           60354         60354           60355         60355           60354         60354           60354         60354           60354         60354           60354         60354</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>1.000</td></t<>	ADC64 X007 ADC State OK	3 System #1	GEM	Link 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C C 0 C C C C	RX Err 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	H     BOO     Event rate     Event attempt     O	EV 0	I         op time           60354         60354           60354         60353           60353         60353           60354         60354           60354         60354           60354         60354           60354         60354           60355         60355           60354         60354           60354         60354           60354         60354           60354         60354	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.000
ilobal EvB	Elec         Optimise           1         AGCGAV           2         ACCGAV           3         ACCGAV           4         ACCGAV           5         ACCGAV           6         ACCGAV           0         ACCGAV           10         ACCGAV           12         ACCGAV           12         ACCGAV           5         State           5         State	24 5600 - 273 7 0000 - 273 7 0766-828 9 0766-828 9 0766-989 9	DD         P Address           10.14.0.146         10.14.0.146           10.14.0.146         10.14.0.146           10.14.0.146         10.14.0.146           10.14.0.146         10.14.0.146           10.14.0.146         10.14.0.146           10.14.0.146         10.14.0.137           10.14.0.146         10.14.0.147           10.14.0.146         10.14.0.147           10.14.0.146         10.14.0.147           10.14.0.146         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.0.146         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         10.14.0.147           10.14.0.147         1	L <sup>1</sup> C E ACC24 F522 4 ACC24 F522 4 ACC24 F522 4 ACC29 F523 4 ACC39 F523 4 ACC39 F523 4 ACC39 F525 4 ACC39 F525 4 ACC39 F526 4 ACC39 F526 4 ACC39 F526 4 ACC26 F521	Yent         Trig on 3           0         0           0 <t< td=""><td>ADC64 X0/f ADC State OK OK</td><td>4 System at 200</td><td>GEM OTHER OTHER</td><td>Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C</td><td>RX Err </td><td>t     t</td><td>EV 0</td><td>te up time 60154 60155 60155 60155 60155 60155 60155 60155 60155 60155 60155 60155 7076D-0889</td><td>LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>1.00) - 9</td></t<>	ADC64 X0/f ADC State OK	4 System at 200	GEM OTHER OTHER	Unk 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Unlock 0 C 0 C 0 C 0 C 0 C 0 C 0 C 0 C	RX Err 	t     t	EV 0	te up time 60154 60155 60155 60155 60155 60155 60155 60155 60155 60155 60155 60155 7076D-0889	LM res 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1.00) - 9

## **MWPC Run Control**

Hrb Status tasks:

- Configure devices.
- Execute mstream program (perform FLP function).
- Check board's status.

<u>File</u> Options	<u>H</u> elp																				
Id	lp	Time	Temp	Spill	Event	Write	ASD	0	ASD	1	ASD	2	А	SD 3		ASD	4	ASI	D 5	Pass	Blo
1 0x046f304f	10.93.120.186	03:10:35	46.2C	0	0		0.000	-	0.000	÷ O	000.	Ŷ	0.0	00	)(	0.000	Ŷ	0.00		0	0
2 0x046efa79	10.93.120.171	03:10:38	46.7C	0	0	V	0.000	÷	0.000	÷0	.000	-	0.0	00	Ĵ	000.0	Ĵ	0.00		0	0
Threshold, V	0.000	Id		lp		Time	Temp	Ever	nt												
Latency, ns	24	0x046f06	6a7 10.	93.120	0.160 15	5:15:29	27.6C	0													
Window, ns	80																				
Min hit dur, ns	8																				
Write Enable																					
Run analyzer		Main Log	0×046f	304f	0x046e	fa79															
		[15:11:50 [15:11:50 [15:11:50 [15:11:50 [15:11:50 [15:11:50 [15:12:40 [15:12:40	] HRB-0 ] [0x040 ] [0x040 ] [0x040 ] [0x040 ] [0x040 ] [0x040 ] [0x040 ] [Remo	host ( 5f304f 5f304f 5f304f 5f304f 5f304f 5f304f 5f304f 5f304f oteCon	updated ] Device ] device ] set as ] set trig ] Times ] Link 0 htrollSer	: 10.93. HRB-0 connec d8 thres g_src=0 tamp m (RESET ver] Est ver] Ser	120.186 online (: ted fw= shold 200 00e; late ismatch ): sync o ablished nd to ren	10.93 1.0.1 48 (0 ency= coun errors conn note c	.120.18 8658 V) 3(24n t 0 0, coo ection control	36) s); wir le erro from :descr	ndow: ors 0 127.0 riptior	=10( 0.0.1 0 Hrb	80n :591 Sta	s); m 15 tus	inHi	tDurat	ion=	4(8ns	;)		



Local Run Control

## **Event Builder**

EvB tasks:

- Recive data from clients
- Construct Completed event from several sub-events
- Send to output
  - File in TDS
  - TCP-server (for upper EvB)

Sub-events

File Options	<u>H</u> elp									
										[12:52:40] [tcpClient #4] "TcpClient "MStream 0x076:82be' connected." [13:02:30] [tcpClient #4] "TcpClient "MStream 0x076:82be' connected." [13:04:20] [tcpClient #4] "TcpClient
										"MStream 0x076c82be' connected." [13:14:48] [tcpClient #4] "TcpClient "MStream 0x076c82be' connected." [13:23:44] [tcpClient #4] "TcpClient
				Тс	rp #0: 37381(0% Reset	)				"MStream 0x076c82be' connected." [13:25:50] [tcpClient #4] "TcpClient "MStream 0x076c82be' connected."
				add c	lient remove c					MStream 0x076c82be' connected."
id reado	ut Online	type	index	host	state	evNum	trashed	all	flushedSize	'MStream 0x076c82be' connected."
	¥	MStream	0x076d09b0	bmp gom	Idle readout (0)	0	0	0	0	MStream 0x076c82be' connected."
2 2 4	¥	MEtroom	0x07640809	bmn-gem	Idle readout (0)	0	0	0	0	<ul> <li>MStream 0x076c82be' connected."</li> </ul>
3 3 4	¥	MStream	0x076c8266	bmn-gem	Idle readout (0)	0	0	0	0	[13:54:24] [tcpclient #4] *1cpclient 'MStream 0x076c82be' connected."
4 4 4	•	MStream	0x076cd411	bmn-gem	Idle readout (0)	0	0	0	0	"Mstream 0x076c82be' connected."
	V	Motream	0x076cd411	bmn-gem	Idle readout (0)	0	0	0	0	- 'MStream 0x076c82be' connected."
6 b V	×	MStream	0x076cba8b	bmn-gem	Idle readout (0)	0	0	0	0	[14:11:02] [tcpClient #4] "TcpClient 'MStream 0x076c82be' connected."
	×	MStream	0x076ce3e5	bmn-gem	Idle readout (0)	0	0	0	0	<pre>[14:15:48] [tcpClient #4] "TcpClient 'MStream 0x076c82be' connected."</pre>
8 8 4	×	MStream	0x030dct31	bmn-gem	Idle readout (U)	0	0	0	0	[14:18:24] [tcpClient #4] "TcpClient 'MStream 0x076c82be' connected."
9 9 7	×	MStream	0x076ce3ee	bmn-gem	Idle readout (U)	0	0	0	0	[14:23:22] [tcpClient #4] "TcpClient 'MStream 0x076c82be' connected."
10 10 V	×	MStream	0x076cd410	bmn-gem	Idle readout (0)	0	0	0	0	"MStream 0x076c82be' connected."
	×	MStream	0x076c8320	bmn-gem	Idle readout (0)	0	0	0	0	[14:29:44] [tcpClient #4] "TcpClient 'MStream 0x076c82be' connected."
12 12 4	v	MStream	0x076ca26	bmn-gem	Idle readout (0)	0	0	U	0	[14:51:08] [tcpCilent #4] * [cpCilent 'MStream 0x076c82be' connected." [14:35:22] [outTcpServers #1] "Curr connection: https://dat.be/jior.u/4574
reg:0;skip:0;eoł	:0;clients:;	nextEv:0	monitor:0							
			Со	mpl	eted e	eve	nt			
		- 7	Eve	ent #	415 he	eac	ler			EvB clients:
			Dev	vice	#A he	ead	ler		•	EvB
			Dev	vice	#A pa	ylo	ad		•	MStream



## **MLDP and PNP**

Device description:

- Ip-addres
- Firmware version / revision
- Model Id# / name
- Serial number
- Master Ip/port
- MStream Ip/port

								0	Device Di	scovery I	Dialog				
	Ту	/pe 🔹	Serial ID	Firmware	Slot		IP Addr	ess	Ma	ster	MStr	eam			ОК
7	ADC6	64VE	076C-D410	01.00.23174	4 7	bmn-	gem-ad	dc02	bmn-gen	n:45510	bmn-gen	1:38315			
3	ADC6	64VE	076D-08B9	01.00.23174	4 14	bmn-	gem-ao	dc06	bmn-gen	1:53703	bmn-gen	n:44449			Cancel
•	ADC6	64VE	076C-D411	01.00.23174	4 10	bmn-	gem-ao	dc12	bmn-gen	n:38053	bmn-gen	1:56485			
0	FVME	2TMWF	046F-35A9	01.01.23970	0 5	bmn-	tmwr-d	laq	free		free				
1	HRB6	SASD	06E9-B8BE	01.00.22544	4 52	bmn-	hrb6-1	-4	bmn-hrb-	1:48820	bmn-hrb-	1:52718			
2	HRB6	SASD	06E9-B820	01.00.22544	4 52	bmn-	hrb6-1	-3	bmn-hrb-	1:39777	bmn-hrb-	1:60112			
3	HRB6	5ASD	046F-2950	01.00.22544	4 52	bmn-	hrb6-1	-2	bmn-hrb-	1:49680	bmn-hrb-	1:33445			
4	HRB6	iasd	06E9-B838	01.00.22544	4 52	bmn-	hrb6-1	-6	bmn-hrb-	1:44133	bmn-hrb-	1:36997			
5	HRB6	SASD	06E9-B83F	01.00.22544	4 52	bmn-	hrb6-1	-5	bmn-hrb-	1:50678	bmn-hrb-	1:39825			
6	TTB9	V	046F-06A0	01.00.2293	7 10	bmn-	ttb9-2		bmn-hrb-	2:44498	free				
7	U40V	'E_SEQ2	2 0612-0DF8	01.00.22938	B 3	bmn-	gem-se	eq01	bmn-gem	n:56713	free				
8	U40V	E_SEQ2	076C-9E38	01.00.22938	8 4	bmn-	gem-se	eq02	bmn-gem	n:50058	free			Ŧ	
	En	St	Manual	add	Firmwa	re	↓ / Slot	Add	↑ Remov	e Ma	stor	MStr	eam		
Ē	En	50	Type .	Scharib	THITING	ine -	5100	11 A	Juliess	ma	5001	mod	cam		
	1	$\checkmark$	ADC64VE	076C-E3EE	01.00.23	174 1	7	bmn-ge	m-adc07	bmn-gen	1:35498	bmn-gerr	n:55024	1	Available device types:
	•	$\checkmark$	ADC64VE	076C-E3E5	01.00.23	174 5		bmn-gei	m-adc09	bmn-gen	1:45266	bmn-gem	n:35240		ADC64VE FVME2TMWR HRB6ASD
	•	$\checkmark$	FVME2TMWR	076D-4265	01.01.23	970 1	0	bmn-tm	wr-tof400	bmn-tof4	00:47262	free			TTB9V U40VE_SEQ2
	1	$\checkmark$	HRB6ASD	06E9-B78B	01.00.22	544 5	2	bmn-hrb	6-1-1	bmn-hrb-	1:48082	bmn-hrb-	-1:42466		U40VE-RC UT24VE-RC
	1	$\checkmark$	TTB9V	046F-06A7	01.00.22	937 7		bmn-ttb	9-1	bmn-hrb-	1:45177	free			

Program description:

- UUID
- App. type
- App. index
- Host address
- List of interfaces
  - Type/id
  - Host
  - Port
  - Free flag

## The end

Thank you!

