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C R A T E C H A S S I S R A H M E N C O N T E N I

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N Ë E S D A T E N D A T I R E P O N S E E C H O

R I P O S T A R E S P O N S E L Ö S C H E N C A N

A CAMAC GLOSSARY

PREFACE

This glossary is published as a supplement to the CAMAC Bulletin in the expectation that it will lead to a better understanding of CAMAC.

The definitions and translations represent the opinions of individual experts working in the CAMAC area and are not formal statements by the ESONE or NIM Committees or the Commission of the European Communities.

The CAMAC Specifications [1,2] include full formal definitions of the terms shown in bold italic type in this glossary. It is not intended that the informal definitions in the glossary should modify or supersede the formal definitions in the specifications.

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CAMAC

A CAMAC GLOSSARY

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ABSTRACT

This glossary covers specialized technical terms used in connexion with the CAMAC standards for modular data handling equipment. For each term there is an informal definition, and the term is translated into French, German and Italian.

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* *In this glossary the definitions of some well-known and widely-used terms reflect a particular shade of meaning in the context of CAMAC.*

1. NAMES

101 *CAMAC*
CAMAC
CAMAC
CAMAC
– A specification for modular data handling equipment, based on standard interfaces to a highway. The name is *not* an acronym.

102 *JANUS (IANUS)*
– Names originally proposed for CAMAC but abandoned shortly before publication of the specification.

111 *ESONE*
ESONE
ESONE
ESONE
– A multi-national committee representing European nuclear laboratories. It specified the ESONE system of modular equipment (EUR1831e) but is now primarily concerned with CAMAC. Acronym for "European Standard Of Nuclear Electronics".

112 *ESONE Members*
Membres du Comité ESONE
ESONE Mitglieder
Membri ESONE
– Non-profitmaking laboratories and organizations with a nominated representative on the ESONE committee.

113 *Executive Group (XG)*
Groupe exécutif (ESONE)
Executive Group (ESONE)
Gruppo Esecutivo (ESONE)
– Manages the affairs of ESONE when the General Assembly is not in session.

114 *ESONE Working Groups*
Groupes de travail ESONE
ESONE Arbeitsgruppen
Gruppi di lavoro ESONE
– Appointed by the ESONE Committee for specific tasks. At present: Dataway W.G. (data transfer standards), Mechanics W.G. (crates, modules etc.), Analogue Signals W.G., Information W.G. (CAMAC Bulletin) and Software W.G.

121 *CAMAC Bulletin*
Bulletin CAMAC
CAMAC Bulletin
Bolletino CAMAC
– A publication of the ESONE Committee (first issued June 1971).

141 *NIM*
NIM
NIM
NIM
– A committee sponsored by U.S. Atomic Energy Commission. Specified the NIM (Nuclear Instrument Module) system. Has endorsed the use of CAMAC and maintains close liaison with ESONE.

151 *European Communities –Commission of*
Commission des Communautés Européennes
Kommission der Europäischen Gemeinschaften
Commissione delle Comunità Europee
– Supports ESONE by providing a secretariat in EURATOM, publishing the CAMAC specifications, and publishing CAMAC Bulletin.

152 *EURATOM*
Euratom
Euratom
Euratom
– Activities of the Commission of the European Communities in the nuclear field.

2. DEFINED STRUCTURE OF CAMAC

201 *Crate*
Châssis
Rahmen
Contenitore
– A chassis for CAMAC plug-in units (c.f. NIM *bin*, ESONE *case*).

202 *Dataway*
Interconnexion (avec I majuscule)
Datenweg
Interconnessione
– The multi-wire digital highway interconnecting all stations in a CAMAC crate.

203 ***Plug-in Unit***
Tiroir
Einschub-Einheit
Cassetto modulare

– General term for CAMAC units, including modules and controllers.

204 ***Module***
Tiroir
Module
Modulo

– A particular class of controlled CAMAC plug-in units, mounted in one or more normal stations.

205 ***Controller***
(Crate Controller)
(Dataway Controller)
Contrôleur
(Contrôleur de châssis)
(Contrôleur d'Interconnexion)
Steuerung
(Rahmensteuerung)
(Datenwegsteuerung)
Modulo di controllo
(Modulo di controllo del contenitore)
(Modulo di controllo dell'interconnessione)

– A particular class of CAMAC plug-in units, mounted in the control station and one or more normal stations of a CAMAC crate.

211 ***Normal Station***
Station normale
Normale Station
Stazione normale

– One of the mounting positions for plug-in units in the CAMAC crate, giving access to the Dataway, including the data lines.

212 ***Control Station***
Station de contrôle
Steuerstation
Stazione di Controllo

– The right-hand mounting position in a CAMAC crate, with access to the Dataway, including all Station Number and Look-at-Me lines but not the data lines.

213 ***Dataway Connector***
Connecteur pour l'Interconnexion
Datenwegsteckverbindung
Connettore dell'interconnessione

– The 86-way plug and socket by which CAMAC modules and controllers are connected to the Dataway at stations in the crate.

214 ***Bus-line***
Ligne omnibus
Sammelleitung
Linea omnibus

– A signal or power line joining corresponding contacts at each Dataway connector socket (or at only the normal stations).

215 ***Individual Line***
Ligne individuelle
Individuelle Leitung, Stichleitung
Linea individuale

– A line joining one contact at the Dataway control station to a contact at one normal station. Used for N and L lines.

216 ***Free Bus-Lines***
Lignes omnibus libres
Freie Sammelleitungen
Linee omnibus libere

– Two additional free-use bus-lines (P1, P2) linking all normal Dataway stations (introduced in 1972 revision in place of individual patch contacts P1 and P2).

217 ***Patch Contacts***
Contacts accessoires
Sonderstifte
Terminali per connessioni facoltative

– Individual free-use contacts at each Dataway station (P3, etc).

218 *Patch Connections*
Connexions accessoires
Sonderverbindungen
Connessioni facoltative

– Free-use interconnections involving the patch contacts.

219 *Patch Points*
Points de connexions accessoires
Anschlußstifte
Punti di attacco per connessioni facoltative
– Access points for patch connections, avoiding the need for connecting directly to the pins of the Dataway connector.

220 *Pull-up*
Polarisation
Pull-up
Ripristino
– [CAMAC Dataway] – a means of biasing each signal line to '0' state in absence of '1' signals.

231 *Mandatory Power Lines*
Lignes d'alimentation Obligatoires
Zwingend vorgeschriebene Versorgungsleitungen
Linee di alimentazione obbligatorie
– Bus-lines in the Dataway for +24V, +6V, 0V, -6V and -24V. These are normally powered in CAMAC systems.

232 *Additional Power Lines*
Lignes d'alimentations accessoires
Zusätzliche Versorgungsleitungen
Linee di alimentazione ausiliarie
– Bus-lines in the Dataway. These must be wired, but need not be powered unless required for use.

251 *Branch*
Branche
Branch
Diramazione (o ramo)
– An assembly of up to seven crates and a branch driver, interconnected by sections of branch highway.

252 *Branch Highway*
Interconnexion de branche
Branch Highway
Collegamento del ramo principale
– The multi-wire digital highway interconnecting the crate controllers and branch driver in a CAMAC branch.

253 *Branch Highway Ports*
Point de raccordement de l'interconnexion de branche
Branch-Nahtstelle
Aree di raccordo (terminali) per il collegamento del ramo principale
– The access points at which crate controllers and branch drivers are joined to the branch highway through Hughes connectors.

254 *Crate Controller Type A*
Contrôleur de châssis type A
Rahmensteuerung Typ A
Modulo di controllo tipo A
– A crate controller with branch highway ports and a specified set of features (see Appendix 1 of EUR4600). The designation 'CCA-1' implies conformity with EUR4600, and 'CCA' implies conformity with either EUR4600 or preliminary issues of that specification.

255 *Branch Driver*
Commande de branche
Branch-Treiber
Elemento di comando della diramazione
– A unit that communicates via the branch highway with up to seven crates. It may be integral with a branch controller or may merely be one branch interface forming part of a system controller.

256 *LAM Grader*
Tiroir de conditionnement des appels
Anforderungs-Sortiereinheit
Elemento di condizionamento dei richiami
– A unit that selects, rearranges or combines the Dataway L signals within one crate to form a set of Graded-L signals (for example associated with Crate Controller Type A).

261 *Termination*
Terminaison
Abschluß
Adattamento
– [CAMAC Branch Highway] a combined pull-up current source to bias a line to the '0' state and terminating impedance matching the characteristic impedance Z_o of the line (to prevent signal reflexions).

3. DATAWAY ORGANIZATION

(Some terms in this section are also used in connexion with Branch Organization, see Section 4)

301 ***Dataway Operation***
Opération sur l'Interconnexion
Datenwegoperation
Operazione sull'interconnessione
– A data transfer or control operation on the Dataway, characterized by the generation of Busy and Strobe signals. Includes command operations and unaddressed operations.

302 ***Command Operation***
Opération d'ordre
Befehlsoperation
Operazione di comando
– A Dataway or Branch operation characterized by the presence of a Command (Station Number, Sub-address and Function).

303 ***Unaddressed Operation***
Opération non adressée
Nichtadressierte Operation
Operazione senza indirizzamento
– A Dataway operation characterized by one of the common control signals, Initialise or Clear, without a command.

304 ***Strobes***
Signaux d'échantillonnage
Strobesignale (S1, S2)
Campionamento
– Dataway bus-lines S1 and S2, carrying timing signals which occur during command operations (S1 and S2) and during unaddressed operations (S2 and possibly S1).

305 ***Busy***
Occupation
Belegt
Occupato
– Dataway bus-line B, carrying a signal indicating that a Dataway operation is in progress.

311 ***Command***
Ordre
Befehl
Comando
– Signals on the Dataway or Branch Highway specifying one or more crates (branch only), one or more stations, a sub-address and a function.

312 ***Station Number***
Numéro de station
Stationsnummer
Numero di stazione
– Individual Dataway lines N1–N24, carrying signals addressing one or more stations (and hence addressing the modules occupying the stations). The Station Number is part of the command.

– Branch Highway lines BN1, BN2, BN4, BN8, BN16 carrying signals which, when decoded in the crate controller, address one or more stations via the Dataway N lines. Codes BN(24), BN(26), BN(28) and BN(30) have special significance in association with Crate Controller Type A.

313 ***Sub-address***
Sous-adresse
Subadresse
Sub-indirizzo
– Dataway bus-lines A1, A2, A4, A8, carrying signals which, when decoded in the module, address a subsection A(n) of the module. The sub-address is part of the command. Also Branch BA lines.

314 ***Function***
Fonction
Funktion
Funzione
– Dataway bus-lines F1, F2, F4, F8, F16, carrying signals which, when decoded in the module, specify the operation as the type defined by function code F(n). The function is part of the command. Also Branch BF lines.

321 ***Data***
Données
Daten
Dati
– All information carried by the Read (R) and Write (W) lines of the Dataway and by branch highway BRW lines during command operations.

322 ***Read***
Lecture
Lesen
Lettura

– Direction of data transfer from modules to crate controller, using Dataway lines R1 to R24, and to the branch driver, using branch highway lines BRW1–BRW24.

323 ***Write***
Ecrire
Schreiben
Scrittura

– Direction of data transfer from branch driver to crate controllers, using branch highway lines BRW1–BRW24, and to modules, using Dataway lines W1–W24.

324 ***Overwrite***
Transcrire
Überschreiben
Trascrizione

– CAMAC term for 'jam transfer' write functions, which force each bit of the selected register in the module to the same logic state as the corresponding Write data line.

325 *Selective Overwrite*
Transcrire sélectivement
Selektives Überschreiben
Trascrizione selettiva

– Partial overwrite functions defined for F(18) and F(19) in EUR4600 (1969). Superseded by Selective Set and Selective Clear.

326 ***Selective Set***
Mettre à 1 sélectivement
Selektives Setzen
Posizionamento selettivo

– Write functions that set selected bits of a register in the module to '1' and leave unselected bits unchanged.

327 ***Selective Clear***
Remettre à zéro sélectivement
Selektives Löschen
Cancellazione selettiva

– Write functions that reset selected bits of a register in the module to '0' and leave unselected bits unchanged.

331 *Status Information*
Indication d'état (état)
Status
Informazione di stato

– Primarily the Dataway signals Response (Q) and Command Accepted (X), but sometimes extended to include Look-at-Me (L) and Busy (B).

332 ***Response***
Réponse
Echo
Riposta

– A one-bit status signal from modules to the crate controller on Dataway line Q and to the branch driver on branch highway line BQ. See also Test Status (354), Test LAM (355), Address Scan Mode (601), Repeat Mode (602), and Stop Mode (603).

333 ***Command Accepted***
Ordre accepté
Befehl angenommen
Comando accettato

– A one-bit status signal from modules to the crate controller on Dataway line X, and to the branch driver on branch highway line BX, indicating ability to perform the action required by the command. (Introduced in 1972 revision.)

341 ***Disable***
Mettre hors service
Abschalten
Disabilitazione

– [General use in CAMAC] to prevent an action until it is specifically re-enabled. Examples: Disable L output, Disable data input.

– A standard CAMAC function, F(24).

342 ***Enable***
Mettre en service
Einschalten
Abilitazione

– [General use in CAMAC] to allow an action (inverse of Disable).

– A standard CAMAC function, F(26).

343 ***Execute***
Exécuter
Ausführen
Esecuzione

– A standard CAMAC function, F(25), to initiate a single-shot action. Example: to generate a single pulse.

345 ***Group 1 (registers)***
Groupe 1 (registres)
Gruppe 1 (registern)
Gruppo 1 (registri)
– In modules–a set of up to 16 registers accessed by commands with function codes F(0, 2, 3, 9, 16, 18, 21).

346 ***Group 2 (registers)***
Groupe 2 (registres)
Gruppe 2 (registern)
Gruppo 2 (registri)
– In modules–a second set of up to 16 registers accessed by commands with function codes F(1, 11, 17, 19). Recommended for information requiring restricted access, and for system status information (e.g. LAM Status, LAM Mask, LAM Requests, and Module Characteristics).

347 ***Module Characteristic***
Nombre caractéristique du tiroir
Module-Kennung
Caratteristica del modulo
– A word read from a module to identify the type of module. Recommended location at sub-address A(15), Group 2. An optional feature that may, for example, be associated with a classification scheme for modules.

351 ***Look-at-Me (LAM)***
Lancement d'Appel par le Module
Anforderung
Richiamo
– An individual signal line from each Dataway normal station to the control station, by which a module can request attention (a demand handling feature, usually abbreviated to LAM or L).

352 ***LAM Source***
Source de LAM
Anforderungs-Quelle
Sorgente di richiamo
– A condition that sets a LAM status bit in a module to demand attention. The LAM source may be in the module or in external equipment and may be a maintained or transitory condition.

353 ***LAM Status Register***
Registre d'état des LAM
Anforderungs-Statusregister
Registro di stato dei richiami
– A group of bistables in a module that are set by the individual LAM sources.

354 ***Test Status***
Contrôler une indication d'état
Prüfen des Status
Esame dello stato

355 ***Test LAM***
Contrôler un LAM
Prüfen der Anforderung
Esame del richiamo
– Standard CAMAC functions to examine the state of a specified feature of a module and generate the appropriate response Q.

356 ***LAM Mask***
Masque de LAM
Anforderungs-Maske
Maschera dei richiami
– Optional feature of modules with multiple LAM sources, consisting of gates controlling which LAM sources give rise to LAM requests. Generally controlled by a Mask Register, recommended location A(13), Group 2.

357 ***LAM Request***
Demande de LAM
Anforderung der LAM-Quelle
Richiesta di richiamo
– In a module, a contribution to the Look-at-Me signal from one of several LAM sources. Multiple LAM requests may be treated as outputs of a (notional) LAM Request Register accessed at A(14), Group 2.

361 ***Common Control Signals***
Commandes générales
Gemeinsame Steuersignale
Segnali di controllo comuni
– The Dataway signals Initialise, Clear and Inhibit, and the branch signal Initialise.

362 ***Initialise***
Initialisation
Initialisieren
Inizio
– A Dataway bus-line (Z) and common control signal associated with an unaddressed operation on the Dataway. Also a branch highway line BZ. Typically used at switch-on to set a CAMAC system to a defined state.

363 ***Inhibit***
Inhibition
Sperren
Inibizione

– A Dataway bus-line (I) and common control signal used to prevent actions, such as data taking, in modules.

– [In general] to prevent a signal output assuming the '1' state while the inhibit condition persists.

364 ***Clear***
Remise à zéro
Löschen
Cancellazione

– A Dataway bus-line (C) and common control signal, associated with an unaddressed operation on the Dataway (not on Branch Highway). All data registers connected to the Clear signal are set to zero.

– Standard function codes (Clear Group 1 Register, Clear Group 2 Register) which clear registers at specified sub-addresses.

371 ***Hold***
Rupture de cycle
Halten, Warten
Mantenimento

– Some CAMAC users assign free bus-line P2 (see 216) to a Hold signal which, in controllers following this convention, delays the generation of Strobe S1 while H=1 is present. (Not defined as part of the CAMAC specifications.)

4. BRANCH ORGANIZATION

(Some relevant terms will also be found under Section 3, Dataway Organization)

401 ***Branch Operation***
Opération de branche
Branch-Operation
Operazione sulla diramazione

– An individual data transfer or control operation on the branch highway. Includes command operations and Graded-L operations.

402 ***Graded-L Operation***
Opération en mode GL
GL-Operation
Operazione sui richiami condizionati

– A Branch operation characterized by the Graded-L Request signal (BG) without a command. It reads a 24-bit Graded-L word giving information about demands in all on-line crates.

403 ***Crate Address***
Adresse de châssis
Rahmenadresse
Indirizzo del contenitore

– A part of the Branch command, specifying one or more of the seven crates by signals on lines BCR1 to BCR7.

404 ***Graded-L Request***
Demande de lecture de la configuration d'appels
Abruf der sortierten Anforderungen (GL-Bitmuster)
Richiesta dei richiami condizionati

– A pseudo-command signal (BG) on the branch highway, by which the branch driver asks for a 24-bit summary of Look-at-Me signals in all on-line crates.

405 ***Branch Demand***
Demande de branche
Branch-Anforderung
Domanda della diramazione

– A demand handling signal (BD) on the branch highway, indicating that at least one module is demanding attention.

406 ***Phase***
Phase
Phase
Fase

– One of the four parts of each branch operation.

407 ***Branch Timing***
Séquence de temps
Branch-Zeitablauf
Sequenza temporale sulla diramazione

– Branch highway 'handshake' signals (BTA, BTB) interlocking the sequence of actions in the branch driver and crate controller.

411 *Graded-L Signals*
Signaux GL
GL-Signale
Richiami condizionati

– A selection, rearrangement, or combination of the Dataway L signals, forming the Graded-L word.

5. GENERAL TERMS IN THE CONTEXT OF CAMAC

501 *Compatibility*
Compatibilité
Kompatibilität
Compatibilità

– CAMAC compatibility is achieved by satisfying the mandatory requirements of EUR4100 for mechanical and electrical interfaces to the Dataway.

502 *Mandatory*
Obligatoire
Zwingend vorgeschrieben
Obbligatorio

– Mandatory requirements must be satisfied by all CAMAC-compatible equipment. Characterized by 'must' in CAMAC Specifications.

503 *Recommended*
Recommandé
Empfohlen
Raccomandato

– Recommended practices should be followed unless there are strong reasons to the contrary. Characterized by 'should' in CAMAC Specifications.

504 *Permitted*
Autorisé
Erlaubt
Permesso

– Permitted practices are allowed but need not be followed. Characterized by 'may' in CAMAC Specifications.

505 *Reserved*
Réservé
Reserviert
Riservato

– Reserved features are not available for general use until released by ESONE. This applies to some function codes F(5, 7, 13, 15, 29, 31), Dataway power lines Y1 and Y2, and some branch highway lines BV1–BV7.

506 *Non-Standard*
Non-standard
Nicht-Standard
Libero

– Non-standard features are free for unspecified uses. This applies to some function codes F(4, 6, 12, 14, 20, 22, 28, 30), patch contacts P3–P7, and bus-lines P1–P2. Non-standard features allow freedom for local interpretations that are not necessarily mutually compatible.

511 *On-line*
En ligne
On-line (betriebsbereit)
In linea

– [CAMAC systems] directly connected to a computer.

– [CAMAC crate controllers] connected to the branch highway and in an operable state.

512 *Off-line*
Hors ligne
Off-line (nicht betriebsbereit)
Fuori linea

– [CAMAC systems] operating without direct connexion to a computer or processor.

– [CAMAC crate controllers] physically connected to the branch highway but not responding to its operations.

513 *Real-time*
Temps réel
Realzeit, schritthaltend
Tempo reale

– Operating on a time scale set by independent external conditions.

521 *Hardware*
Matériel électronique
Hardware
Apparecchiature (hardware)

– Physical equipment

522 *Software*
Programme
Software
Programmi (software)

– Programs defining the sequence of operations in computer-like equipment.

531 *Bit*
Bit
Bit
Bit

– A binary digit. A signal or item of information with only two permitted values, '0' and '1'.

532 *Word*
Mot
Wort
Parola

– A group of bits—typically the maximum group that is processed as a unit within a computer etc. Hence a group of 24 bits in CAMAC. In general the grouping of bits into a word does not necessarily imply their relative numerical values.

533 *Byte*
Byte
Byte
Byte

– A group of bits—typically 8 bits (sometimes 6 bits) associated with character-organized peripherals or with the internal structure of a computer etc.

534 *Low/High Order (Less/More Significant)*
Ordre, inférieur/supérieur (Significatif, Moins/Plus)
Wertigkeit, niedrige/hohe (Wertig, nieder/höher)
Parte meno/più significativa

– Terms indicating the relative value or weighting of the bits in a word or byte, where appropriate. (In CAMAC, Read bit R1 and Write bit W1 are least significant.)

535 *Complement*
Complément
Komplement
Complemento

– The complement of a binary number 'a' is *either* (2^n-a), called 'Two's complement' *or* (2^n-1-a), called 'One's complement'. There is a standard CAMAC function F(3) to generate One's complement.

541 *Register*
Registre
Register
Registro

– [In CAMAC] an addressable data source or receiver, not necessarily with data storage properties. (See 321 for a definition of 'data'.)

542 *Reset (clear)*
Remettre à zéro
Rücksetzen (Lösche)
Azzerare (Cancellare)

– To put a register or signal source into the '0' state.

543 *Set*
Positionner (Mettre à un)
Setzen
Posizionare

– To put a register or signal source into the '1' state.

544 *Peripheral (device)*
Périphérique
Peripheriegerät
Periferico (dispositivo)

– In general an input/output device (or storage device) connected to the I/O facilities of a computer. Hence, by analogy, a device connected to a CAMAC module.

545 *Interface*
Interface
Interface
Interfaccia

– [Preferred] A junction between two parts of a system with the same 'interface standards', e.g. the Dataway connector and Branch Highway port are interfaces in this sense.

– [Widely used] An adaptor or converter between two parts of a system with different 'interface standards', e.g. Crate Controller Type A is an interface in this sense, between the Dataway and Branch Highway.

551 *Intrinsic OR (Wired OR)*
OU câblé
Verdrahtetes ODER
Elemento logico "OD" (OR) intrinseco (O cablato)

– A property of certain logic elements whose outputs generate an OR function when joined together, i.e. if any output is in the '1' state the junction is in the '1' state irrespective of the other outputs.

552 *Cross-coupling (Cross-talk)*
Diaphonie
Übersprechen
Accoppiamento mutuo

– False signals on one (Dataway or Branch Highway) line caused by signals on other lines.

553 *DTL, TTL*

– Families of integrated circuits (Diode-transistor-logic and Transistor-transistor-logic) available from many manufacturers. The CAMAC signal standards are related to the standards of DTL and TTL.

555 *Analogue Signals*
Signaux analogiques
Analogsignale
Segnali analogici

– Signals which convey numerical information by the value of a continuous variable such as amplitude, duration, frequency etc. Recommended standards are given in EUR5100e.

556 *Negative logic*
Logique négative
Negative Logik
Logica negativa

– The convention for binary digital signals used in CAMAC. The more negative state (0V) signifies logic '1', and the more positive state signifies logic '0'.

561 *Demand Handling*
Traitement de la demande
Anforderungsbearbeitung
Elaborazione della domanda

– General term for the means by which requests for attention are transmitted from modules to the crate controller (and branch driver).

562 *Priority Sorter*
Tiroir de conditionnement des priorités
Prioritäts-Sortiereinheit
Selezionatore di priorità

– A means by which relative priorities are attached to different demands (L signals, Graded-L signals) and the demand with highest priority is identified. [Note: this is sometimes a 'distributed' feature, in which priority order corresponds to the sequence of interconnexions between units.]

563 *Multiple addressing*
Adressage multiple
Vielfachadressierung
Indirizzamento multiplo

– A mode of operation in which more than one station (and/or more than one crate in a branch highway system) is addressed simultaneously, but with the same function and sub-address.

564 *Block Transfer*
Transfert de bloc
Blocktransfer
Trasferimento di sequenze di dati

– [In CAMAC sense] a sequence of transfers involving an array of CAMAC addresses and/or an array of store locations (e.g. in a computer store).

6. OTHER SPECIALIZED AND NON-CAMAC TERMS

601 *Address Scan Mode*
Mode scrutation d'adresse
Sequentielle Adressierung (Adress-Mode)
Modo di indirizzamento a scansione

– A recommended block transfer mode involving an array of CAMAC addresses, not necessarily consecutive but each identified by the response Q=1.

602 ***Repeat Mode*** – A recommended block transfer mode in which the CAMAC module indicates by the response Q=0 that it is not ready, and so causes the operation to be repeated.
Mode répétitif
Wiederholende Betriebsart (Wiederhol-Mode)
Modo ripetuto

603 ***Stop Mode*** – A recommended block transfer mode in which the CAMAC module indicates by the response Q=0 when end-of-block has occurred.
Mode arrêt
Stop-Betriebsart (Stop-Mode)
Modo stop

611 *Multi-branch* – A system configuration with more than one branch highway.
Multi-branche
Multibranch
Diramazione multipla

612 *Multi-source* – A system configuration with more than one source of commands.
Multi-source
Multisource
Plurisorgente

613 *System Controller* – A means by which one or more branch highways are interconnected to one or more computers.
Contrôleur système
Systemsteuerung
Unità di controllo del sistema

614 *System Crate (Master crate, base crate)* – A crate in which there are units giving access to more than one branch and/or more than one source of commands.
Châssis système
Systemrahmen
Contenitore del sistema (contenitore principale, contenitore base)

615 *Executive Controller* – Typically in a system crate–a controller whose main function is to transfer commands and data between sources and branch drivers.
Contrôleur de système
Executive-Steuerung
Elemento di controllo supervisore

621 *Branch Controller* – The means by which the branch highway is interconnected to a computer–hence it includes a branch driver and features of a computer peripheral.
Contrôleur de branche
Branchsteuerung
Elemento di controllo della diramazione

622 *Virtual Controller* – A definition of the relationship between CAMAC commands at a hardware interface (branch highway or Dataway) and user statements at a software interface. Practical implementations may involve both hardware and software.
Contrôleur virtuel
Virtuelle Steuerung
Elemento di controllo virtuale

623 *Parallel Processing Controller* – A (branch) controller for autonomous operations, coupled directly to a computer store. It behaves as an extra processing unit which extracts commands from store and transfers data to or from store.
Contrôleur parallèle de processus
Steuerung mit paralleler Verarbeitung
Elemento di controllo per elaborazione in parallelo

625 *Coupler* – A means by which the Dataway or branch highway is interconnected to a computer.
Coupleur
Koppeleinheit, Interface
Elemento di collegamento

626 *Autonomous Operations*
Opérations autonomes
Autonome Operationen
Operazioni autonome

– Operations that are initiated by the CAMAC system (often with commands generated within CAMAC). Used in contrast to 'programmed' operations which are typically initiated by a program running in the processing unit (CPU) of an associated computer.

633 *NIM Adaptor*
Adapteur NIM
NIM-Adapter
Adattore NIM

– Allows a NIM module to pick up power supplies from a CAMAC Dataway Station.

634 *Bin*
Châssis pour modules NIM
NIM-Rahmen
Cassa (NIM)

– [NIM] a chassis for NIM modules.

7. REFERENCES

1. CAMAC A Modular Instrumentation System for Data Handling. Description and Specification. Revised version. Commission of the European Communities, EUR4100e, August 1972.
(Also published as USAEC, TID–25875, July 1972).

2. CAMAC Organisation of Multi-crate Systems. Specification of the Branch Highway and CAMAC Crate Controller Type A. Commission of the European Communities, EUR4600e, April 1972.
(Also published as USAEC, TID–25876, March 1972).

3. CAMAC A Modular Instrumentation System for Data Handling. Specification of Amplitude Analogue Signals. Commission of the European Communities, EUR5100e, August 1972.

4. Supplementary Information on CAMAC Instrumentation System. CAMAC Bulletin No.6, March 1973, Supplement.
(Also published as USAEC TID–25877, December 1972).

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